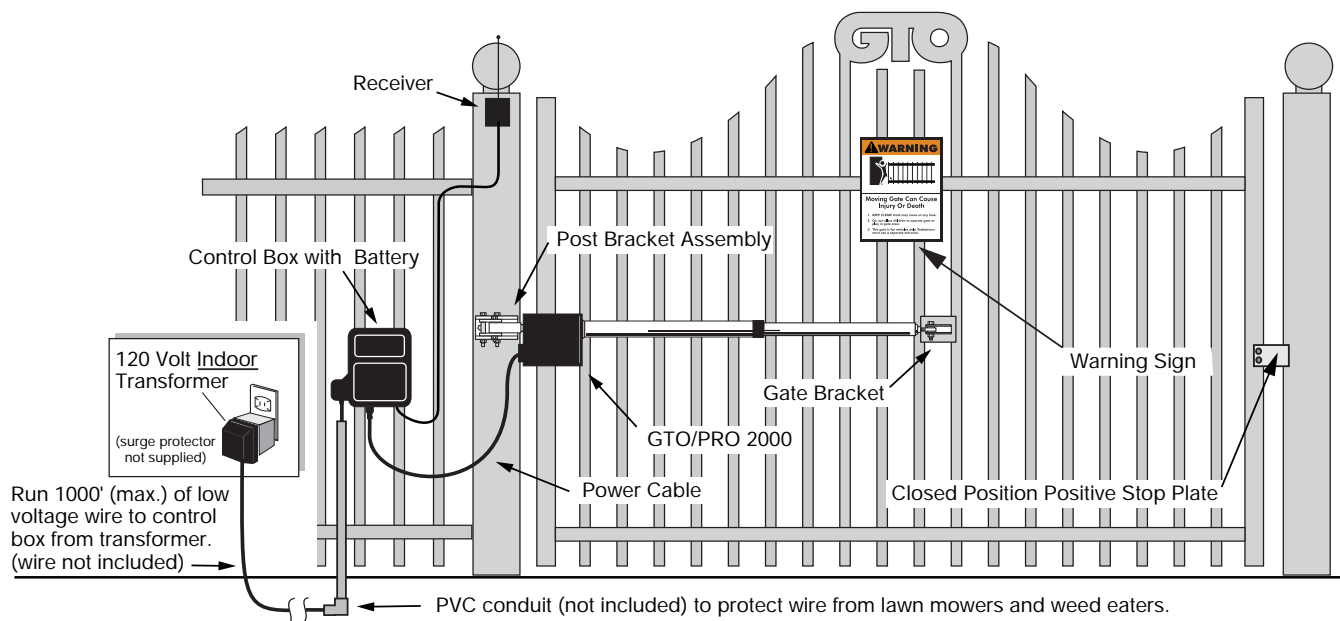




GTO/PRO[®] 2000 SERIES

AUTOMATIC GATE OPERATOR
FOR VEHICULAR SWING GATES

INSTALLATION MANUAL FOR THE PROFESSIONAL INSTALLER



WARNING!



READ ALL INSTRUCTIONS CAREFULLY AND COMPLETELY before attempting to install and use this automatic gate operator. This gate operator produces a high level of force. Stay clear of the unit while it is operating and exercise caution at all times.

This product meets and exceeds the requirements of UL 325, the standard which regulates gate operator safety, as established and made effective March 1, 2000, by Underwriters Laboratories Inc.



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GTO/PRO 2000 series automatic gate operators are intended for use with vehicular swing gates. These operators can be used in Class I, Class II and Class III applications.

VEHICULAR GATE OPERATOR CLASS CATEGORIES

Residential Vehicular Gate Operator-Class I: A vehicular gate operator (or system) intended for use in a home of one-to-four single family dwelling, or a garage or parking area associated therewith.

Commercial/General Access Vehicular Gate Operator-Class II: A vehicular gate operator (or system) intended for use in a commercial location or building such as a multifamily housing unit (five or more single family units), hotel, garages, retail store, or other building servicing the general public.

Industrial/Limited Access Vehicular Gate Operator–Class III: A vehicular gate operator (or system) intended for use in an industrial location or building such as a factory or loading dock area or other locations not intended to service the general public.

Restricted Access Vehicular Gate Operator–Class IV: A vehicular gate operator (or system) intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

Converting Metric Units to English Equivalents

When You Know	Multiply By	To Find	Symbol
centimeters	0.3937	inches	in. (or ")
meters	3.2808	feet	ft. (or ')
kilograms	2.2046	pounds	lb. (or #)

Converting English Units to Metric Equivalents

When You Know	Multiply By	To Find	Symbol
inches	2.5400	centimeters	cm
feet	0.3048	meters	m
pounds	0.4535	kilograms	kg

Converting Temperature

deg. Celsius	$(^{\circ}\text{C} \times 1.8) + 32$	deg. Fahrenheit	$^{\circ}\text{F}$
deg. Fahrenheit	$(^{\circ}\text{F} - 32) / 1.8$	deg. Celsius	$^{\circ}\text{C}$


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IMPORTANT SAFETY INSTRUCTIONS

Because automatic gate operators produce high levels of force, all system designers, installers, and consumers have an obligation to know the potential hazards associated with improperly designed, installed, or maintained gate operator systems. *Keep in mind that the gate operator is just one component of the total gate operating system.* Each component must work in unison to provide the consumer with convenience, security, and safety.

This manual contains various safety precautions and warnings for the system designer, installer, and consumer. Because there are many possible applications of the gate operator, the safety precautions and warnings contained in this manual cannot be completely exhaustive in nature. They do, however, provide an overview of the safe design, installation, and use of this product. **CAREFULLY READ AND FOLLOW ALL SAFETY PRECAUTIONS, WARNINGS, AND INSTALLATION INSTRUCTIONS TO ENSURE THE SAFE SYSTEM DESIGN, INSTALLATION, AND USE OF THIS PRODUCT.**

The precautions and warnings in this manual are identified with this  warning symbol. The symbol identifies conditions that can result in damage to the operator or its components, serious injury, or death.


Because GTO automatic gate operators are *only part of a total gate operating system*, it is the responsibility of the designer, installer, and purchaser to ensure that the total system is safe for its intended use.

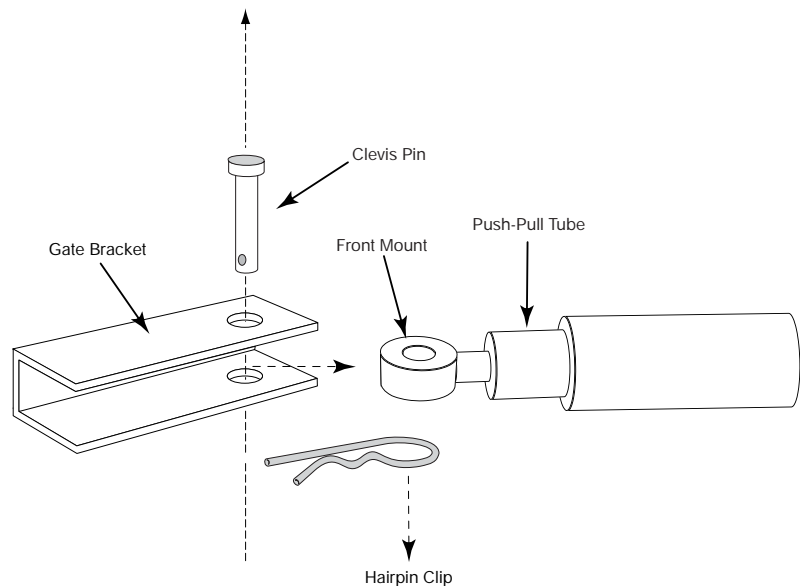
To Manually Open and Close the Gate, Follow the Procedure Below:

Disconnecting the Operator

1. Turn control box **OFF**.
2. Remove hairpin clip and clevis pin from front mount.
3. Pull front mount away from gate bracket.

The gate can be opened and closed manually when the gate operator is disconnected.



 **CAUTION: Disconnect the operator ONLY when the control box power switch is OFF and the gate is NOT moving.**



IMPORTANT SAFETY INSTRUCTIONS

FOR THE SYSTEM DESIGNER


WARNING: To reduce the risk of injury or death:

1. **READ AND FOLLOW ALL INSTRUCTIONS.**
-  2. This operator is intended for use only on vehicular gates. Pedestrians must be supplied with a separate walk-through gate (*see Entrapment Protection illustration on page 6*).
3. When designing a system that will be entered from a highway or main thoroughfare, make sure the system is placed far enough from the road to prevent traffic congestion.
-  4. The gate must be installed in a location that provides adequate clearance between it and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates **shall not** open into public access areas.





FOR THE INSTALLER

WARNING—To reduce the risk of injury or death:

I. Before Installation

1. **READ AND FOLLOW ALL INSTRUCTIONS.**
2. Verify this operator is proper for the type and size of gate, and its frequency of use.
3. Make sure the gate has been properly installed and swings freely in both directions. Repair or replace all worn or damaged gate hardware prior to installation. A freely moving gate will require less force to operate and will enhance the performance of the operator and safety devices used with the system.
-  4. Review the operation of the system to become familiar with its safety features. Understand how to manually open and close the gate by disconnecting the operator (*see page 1*).
5. This gate operator is intended for vehicular gates **ONLY**. A separate entrance or gate must be installed for pedestrian use (*see page 6*). **NO ONE SHOULD CROSS THE PATH OF A MOVING GATE.**

II. During Installation

1. Install the gate operator on the inside of the property and fence line. **DO NOT** install an operator on the outside of the gate where the public has access to it. Swinging gates **shall not** open into public access areas.
-  2. Be careful with moving parts and avoid close proximity to areas where fingers or hands could be pinched.
-  3. Installation of additional safety equipment such as safety edges (or photoelectric sensors) is suggested for augmented protection against entrapment (*see page 6*).
-  4. Determine the best obstruction sensing setting for this installation. The gate **MUST** stop and reverse on contact with an obstruction or when an object activates the non-contact sensors. After adjusting the force or the limit of travel, retest the gate operator. **Failure to adjust and retest the gate operator properly can increase the risk of injury or death.**
-  5. Mount access controls away from the gate (**minimum** distance is 10 feet). The user must have full view of the gate but be unable to touch it while operating the controls.
6. Secure outdoor or easily accessed gate operator controls in order to prohibit unauthorized use of the gate.

IMPORTANT SAFETY INSTRUCTIONS

III. After Installation

1. Review **ALL** safety instructions with the consumer/end user. Explain the basic operation and safety systems of the entire gate operator system, including disconnecting the operator for manual operation of the gate.
2. Attach the **warning signs** (included) to each side of the gate to alert public of automatic gate operation. Take a photo of warning signs installed on gate. Record the date of the photo for your reference.
3. **SAVE THESE INSTRUCTIONS.**
Leave a copy of the **IMPORTANT SAFETY INSTRUCTIONS** section of this manual with the consumer/end user.

IMPORTANT SAFETY INSTRUCTIONS

Secondary Means of Protection Against Entrapment

As specified by Underwriters Laboratories Inc. UL 325 (30A.1.1), automatic gate operators shall have *provisions for, or be supplied with*, at least one independent primary and one independent secondary means to protect against entrapment. GTO gate operators utilize **Type A**, an inherent entrapment sensing system, as the *primary* type of entrapment protection. The GTO/PRO 2000 series gate operators have *provisions for* the connection of **Type B1** and **B2** protection to be used as a *secondary* type of entrapment protection, if desired.

1. For gate operators utilizing a non-contact sensor (Type B1) in accordance with UL 325 (51.8.4 [h]):

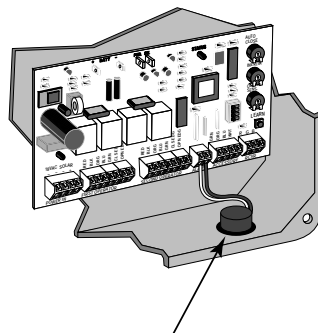
- A. Refer to the sensor manufacturer's instructions on the placement of non-contact sensors for each type of application.
- B. Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is still moving.
- C. One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier.

2. For gate operators utilizing a contact sensor (Type B2) in accordance with UL 325 (51.8.4 [i]):

- A. One or more contact sensors shall be located at the leading edge, bottom edge, and post mounted both inside and outside of a vehicular swing gate system.
- B. A hard wired contact sensor shall be located and its wiring arranged so that the communication between the sensor and the gate operator is not subjected to mechanical damage.
- C. A wireless contact sensor such as one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless contact sensor shall function under the intended end-use conditions.

ENTRAPMENT ALARM (UL 325; 30A.1.1A)

The GTO/PRO 2000 series gate operators are designed to stop and reverse for 2 seconds when the gate comes in contact with an obstruction or when an object activates the non-contact sensors. Additionally, these operators are equipped with an **audio entrapment alarm** which will function if the unit obstructs *twice* while opening or closing. This alarm will sound for a period of 5 minutes or until the operator receives an intended signal (e.g., a transmitter signal) and the gate returns to a fully open or fully closed position.
















Entrapment Alarm
(bottom right of control box)

IMPORTANT SAFETY INSTRUCTIONS

Consumer/End User

WARNING: To reduce the risk of injury or death:

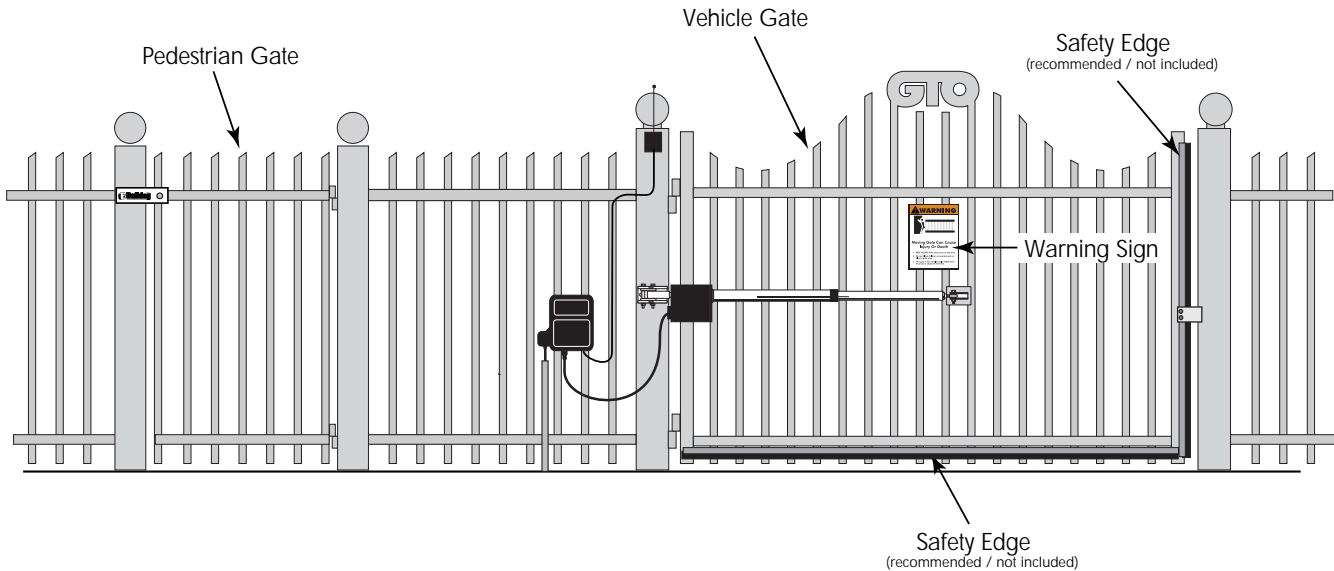
-  1. **READ AND FOLLOW ALL INSTRUCTIONS.**
-  2. Distribute and discuss copies of the **IMPORTANT SAFETY INSTRUCTIONS** with all persons authorized to use your gate.
-  3. Always keep people and objects away from the gate and its area of travel.
NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.
-  4. Your automatic gate is not for pedestrian use. If pedestrian traffic is expected near the gate, a walk-through gate must be installed for this purpose (*see page 6*).
-  5. Do not allow children or pets near your gate. **Never let children operate or play with gate controls.** Keep the remote controls away from children and unauthorized users; store controls where children and unauthorized users do not have access to them.
-  6. If push buttons or key switches are installed, they should be within sight of the gate, yet located far enough from it (at least 10 feet) so the gate cannot be touched while it is in operation. Do not operate any control without watching the movement of the gate.
-  7. Do not activate your gate operator unless you can see it and can determine that its area of travel is clear of people, pets, or other obstructions.
-  8. It is your responsibility to make sure that the installer posted warning signs on both sides of your gate. If any of these signs or warning decals become damaged, illegible or missing, replace them immediately. Contact your installer or GTO for replacements.
-  9. If electric safety edge sensors (or photoelectric sensors) have been installed (*see page 6*) they should be tested monthly for proper function.
-  10. **KEEP GATES PROPERLY MAINTAINED.** Clean the push-pull tube with a soft, dry cloth and apply silicone spray to it at least once per month.
-  11. Have your gate operator tested monthly and serviced regularly by an experienced technician. The gate **MUST** stop and reverse on contact with an obstruction or when an object activates the non-contact sensors. If these functions are observed to operate improperly, discontinue use and have operator serviced immediately.
-  12. To operate this equipment safely, **YOU** must receive detailed instructions on disconnecting the operator for manual gate operation (*see page 1*). If you feel you have not received full and proper instructions, contact your installer.
-  13. Disconnect the operator **ONLY** when the control box power switch is **OFF** and the gate is **NOT** moving.
14. **SAVE THESE INSTRUCTIONS.**

IMPORTANT SAFETY INSTRUCTIONS

Required Safety Precautions for Swing Gates

Install Warning Signs

Warning signs alert people of automatic gate operation and are **required** when installing the GTO/PRO 2000 series gate operator. Furthermore, a walk-through gate must be installed if pedestrian traffic is expected near the vehicle gate. We recommend the **GTO Bulldog Pedestrian Gate Lock** (see *Accessory Catalog*) for controlled access.



Entrapment Protection

GTO's internal obstruction settings, even when properly adjusted, **may not be sensitive enough to prevent bodily injury in some circumstances**. For this reason, safety devices such as safety edge sensors (or photoelectric sensors), which stop and reverse gate direction upon sensing an obstruction, are suggested for augmented protection against entrapment in certain applications.



Warning Signs

The warning signs (*at left*) must be installed on both sides of the gate (*see page 7 for details*).

IMPORTANT SAFETY INSTRUCTIONS

Warning Signs and Labels

These warning labels should be found at the locations specified below. If any of them are missing, immediately contact GTO for replacements.



warning signs (2 enclosed) to be installed on each side of the gate (3–5 feet above the bottom of the gate)



warning labels (2) installed on each side of operator housing



9901178

GTO-2000 Series
Conforms to UL 325 STANDARDS
 Maximum Gate: 1000 lb. (453.5 kg); 20 ft. (6.1 m)
 Voltage: 12 Vdc; Frequency: 0 Hz; Power: 49.7 W
 Class I, II and III Vehicular Swing Gate Operator.
 Serial Number: 2000-xxxxxxx

TO MANUALLY OPEN AND CLOSE THE GATE:

1. Turn control box power switch OFF.
2. Remove hairpin clip and clevis pin from front mount.
3. Pull front mount away from gate bracket.

Disconnect operator ONLY when the control box power switch is OFF and the gate is NOT moving.

GTO, Inc. Tallahassee, Florida USA
RB2002

product identification and manual operation label installed on control box cover

Technical Specifications

GTO/PRO 2000 Series Swing Gate Operators

DRIVE

- Low friction screw drive (linear actuator).
- Temperature rating of motor -30 °F (-34 °C) to +160 °F (71°C).
- Powered by a 12 Vdc motor; generates 650 ft. lb. of torque at 12 V.
- 110° degree opening time approximately 15 to 20 s.
- Maximum push-pull tube stroke 24”.
- Operator length with push-pull tube fully retracted is 39” (99 cm), mounting point to mounting point.
- Limit switches are internal.

POWER

- System is powered by a 12 Vdc, 7.0 Ah, sealed, rechargeable battery.
- Battery charge maintained by 120 Vac, 60 Hz input and 18 Vac at 40 VA (2.9 A) output; transformer rectified to 14.5 Vdc through the **GTO** Control Board. Control board fuses (2) are rated for 15 A.
NOTE: DO NOT connect transformer directly to any battery. Do not replace fuses with higher ampere rated fuses; doing so will void your warranty and may damage your control board.
- Battery charge maintained by **GTO** Solar Panel Charger: float voltage 14.5 Vdc output from 19³/₈" x 15¹/₄" silicon alloy panel; generates minimum of 10 W at 600 mA. Gated diode on control board prevents battery discharge.

CONTROL

- **GTO** microprocessor-based control board is set for single leaf, pull-to-open gate installations. DIP switches can be adjusted to accommodate an optional kit for push-to-open gates (*see Accessory Catalog*).
- Control board has temperature compensated circuits.
- A circuit on the control board regulates charging. "Sleep draw" is 40 mA; "active draw" is 2 to 5 A.
- Auto-memorization of digital transmitter code.
- **GTO** remote-mounted RF receiver tuned to 318 MHz.
- adjustable auto-close timer (OFF to 120 s), inertia, and obstruction sensitivity using three (3) potentiometers.
- Power terminal block accommodates a transformer and solar panels.
- DIP switches simplify setup of gate operator.
- Accessory terminal block fully compatible with push button controls, digital keypads, safety loops, card readers, etc.
- Control board allows connection of safety edge sensors and photoelectric sensors.
- Audio entrapment alarm sounds if unit encounters an obstruction *twice* while opening or closing.

OPERATIONAL CAPACITY

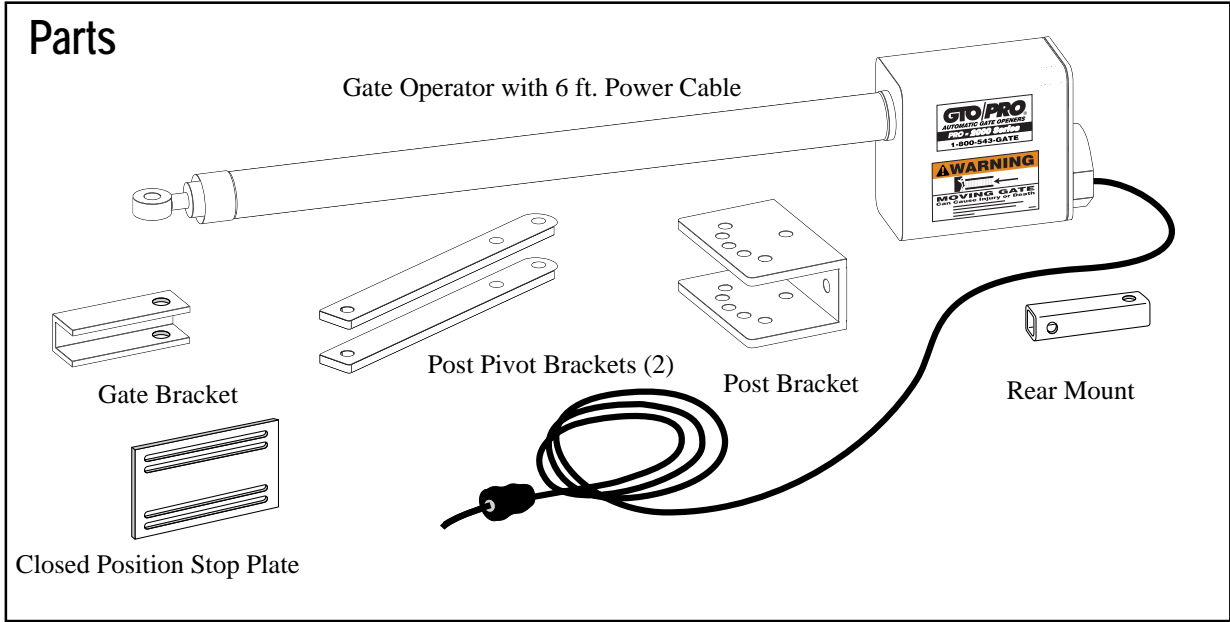
- The **GTO/PRO 2000** series will move gates weighing up to 1000 lb. (453 kg) and up to 20 ft. (6.1 m) in length **provided all installation procedures have been followed. Ball bearing hinges should be used on all gates weighing over 250 lb. (113.4 kg).**

Gate Weight	1000 lb.	160	150	140	130	120	110	100
	800 lb.	170	160	150	140	130	120	110
	600 lb.	180	170	160	150	140	130	120
	400 lb.	190	180	170	160	150	140	130
	200 lb.	200	190	180	170	160	150	140
		6-8 ft.	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
Gate Length								

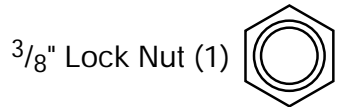
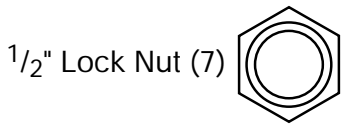
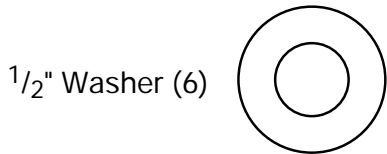
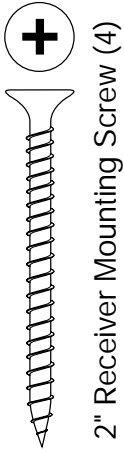
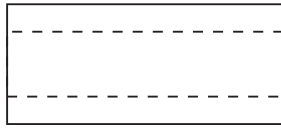
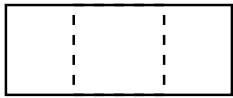
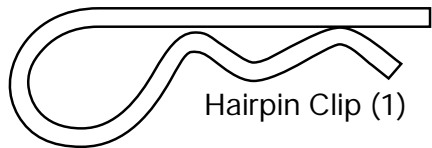
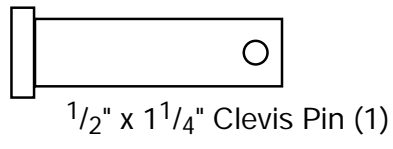
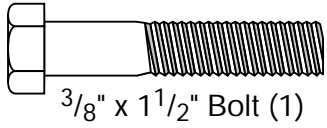
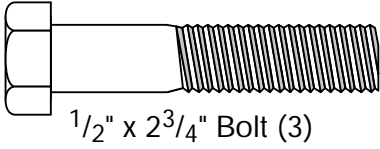
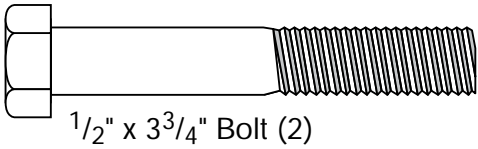
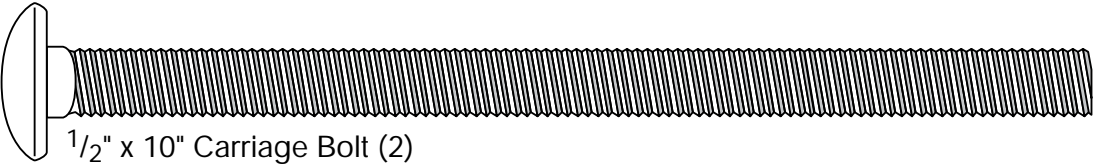
- The **GTO/PRO 2000** series operators are capable of continuous duty cycling. For questions about specific applications and information regarding cycling duty when charged by solar panels, call the **GTO** service department at (800) 543-GATE [4283] or (850) 575-0176.

These Specifications are subject to change without notice.

Single Gate Operator Parts List



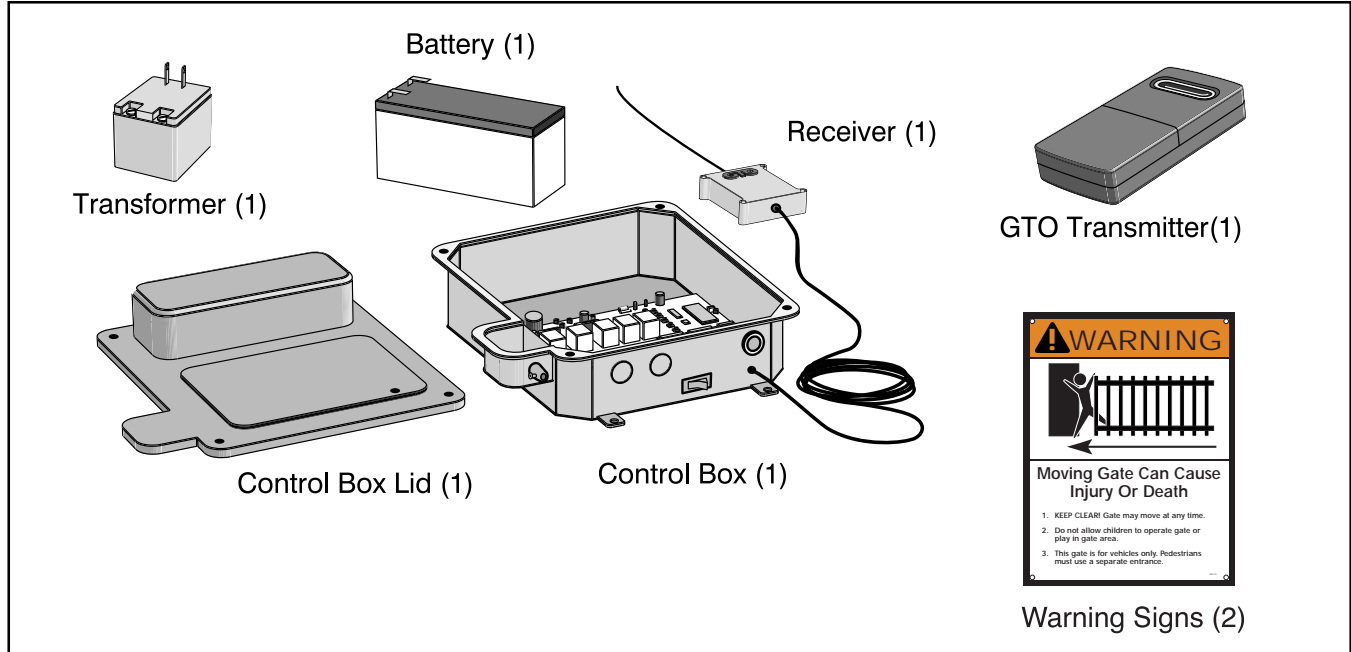
Hardware (not to scale)



8" Nylon Cable Tie (14)

Single Gate Operator Parts List

Control Box and Electrical Components



OTHER MATERIALS YOU MAY NEED BEFORE YOU START THE INSTALLATION:

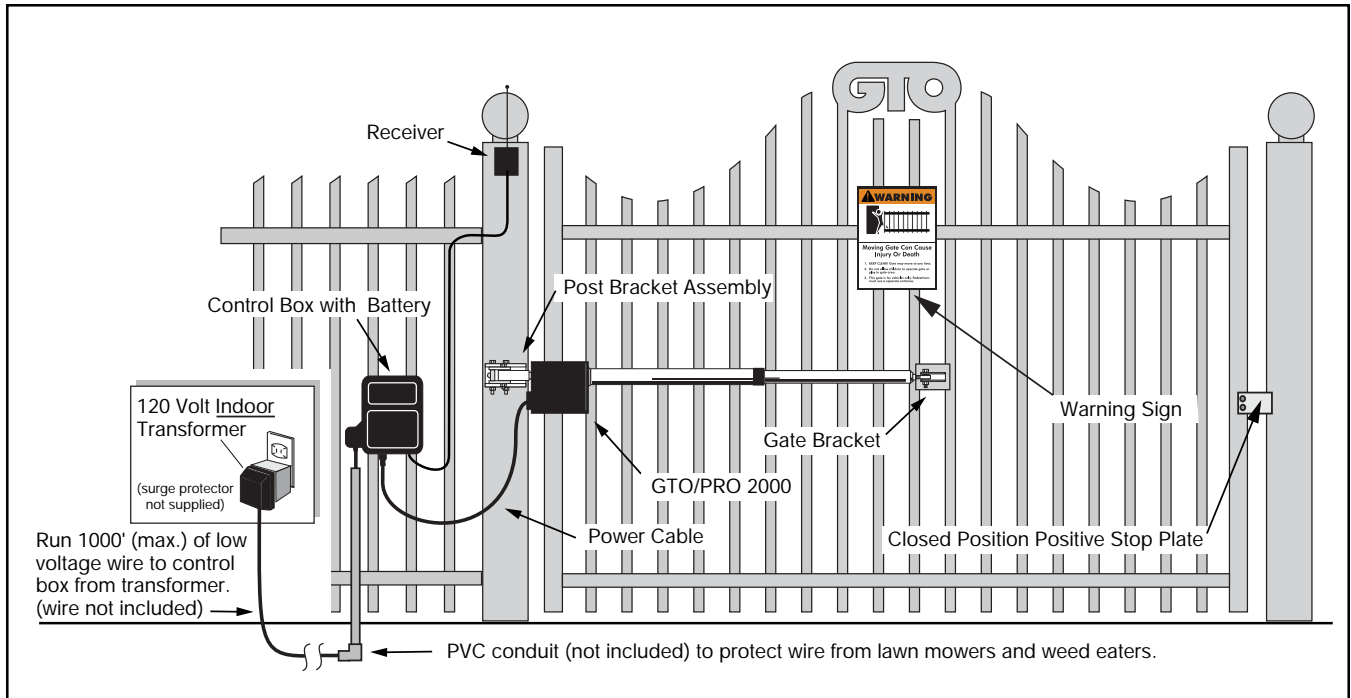
Depending on the type of gate and fence post, you may need some additional materials/hardware. Some of these items can be found in the *GTO/PRO Accessory Catalog*.

- **All** gates will need a stop post in the open position. This post is not provided. See page 16, **Installation of Open and Closed Position Stops** for more information.
- Low voltage wire may be needed. Length depends upon the distance between the transformer power supply and the control box. See page 19, **Powering the System** and the *Accessory Catalog* for wire and solar charging panels.
- If the gate is more than 1000' away from an AC power source you will need to use at least one GTO Solar Panel to trickle charge the battery. See the *Accessory Catalog*.
- The diameter of the fence post should be at least 8" (round) or 6" (square) in order to mount the post bracket (see *page 12*). An optional 4" bracket can be used with 4" post, and mounting bracket adapters must be used with 4" and 6" round posts. (See *Accessory Catalog*).
- Depending upon the diameter of the fence post, you may need longer carriage bolts than those provided. Bolts should be at least 1" longer than the diameter of the fence post (see *page 12*).
- If using thin wall tube or panel gates, see page 14 for recommended reinforcement materials.
- A horizontal or vertical cross member or mounting plate may be needed to mount the operator to the gate. See page 11.

Single Gate Operator Installation

Pull-to-Open Single Gate (gate opens into the property)

The diagram below is an example of a single leaf, pull-to-open installation on an ornamental iron gate. If you are installing a **Push-to-Open** (gate opens out from the property) system, *see page 31*. Or, if you are mounting the operator on a **masonry column**, please *refer to page 36* before proceeding.



Preparing the Gate

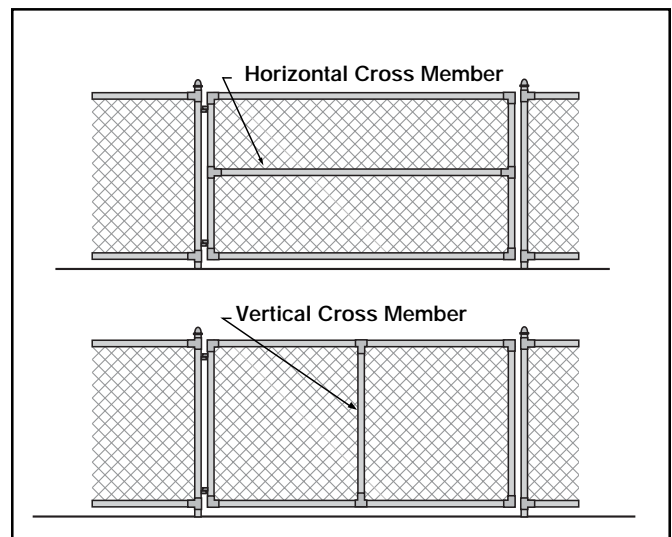
Step 1:

The gate **must** be in proper working order, plumb, level and swinging freely on its hinges. Do not use wheels on gate. The gate must move smoothly and evenly throughout its swing, **without binding or dragging on the ground**. Gates over 250 lb. should have ball bearing hinges with grease fittings.

Step 2:

The fence post must be strongly secured in the ground with concrete so it will not twist or flex when the operator is powered. It is important to position the operator near the **midline** of the gate to keep the gate from twisting and flexing. The addition of a **horizontal or vertical cross member** may be necessary (if one is not already in place) to provide a stable area to which the gate bracket can be secured.

For the operator to perform properly, Steps 1 & 2 must be complete before you go any further with the installation.



Installing The Post Bracket Assembly

The position of the post bracket determines the leverage of the operator and the clearance between the operator and the gate.

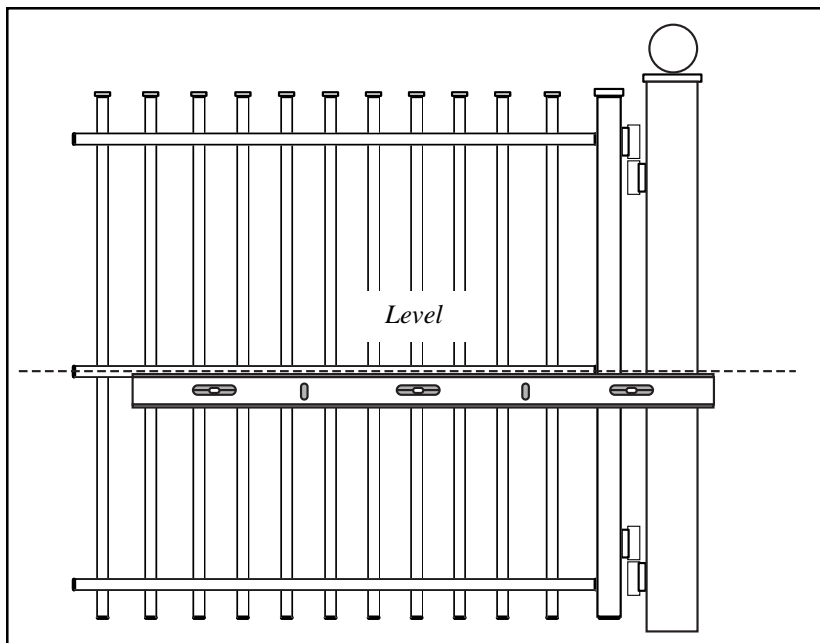
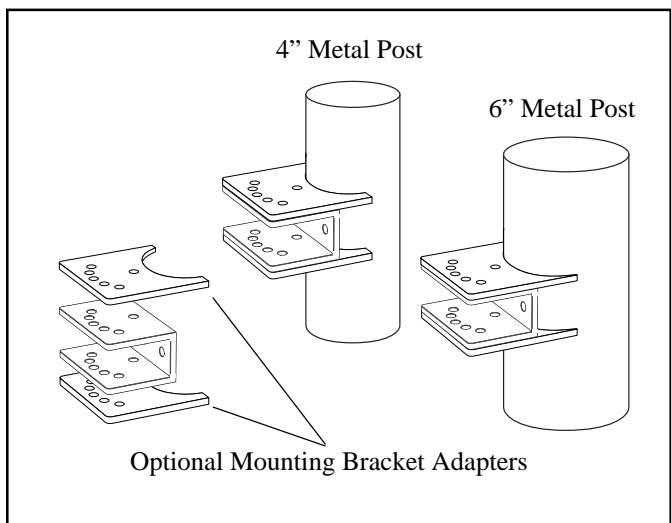
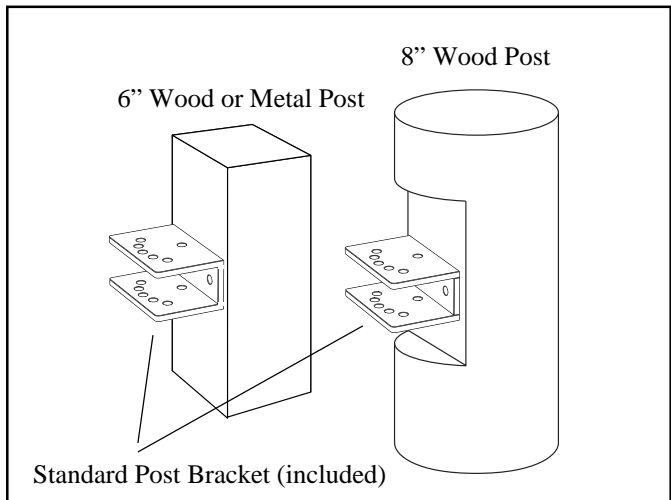
The post bracket is designed to work on a *flat* fence post. Fence posts must be at least 6" square in order to mount the post bracket.

NOTE: The best method of attaching the post bracket to metal post is welding. Round wood posts (no smaller than 8" diameter) may be notched to create a flat surface for attaching the post bracket.

If bolts are used to mount the post bracket, the bolts must *completely* penetrate the fence post. If your fence post is wider than 8", it will be necessary to use carriage bolts longer than those supplied. On **wood** posts use a metal plate (not provided) between the nuts and post to prevent the operator from pulling the bolts and washers through the wood.

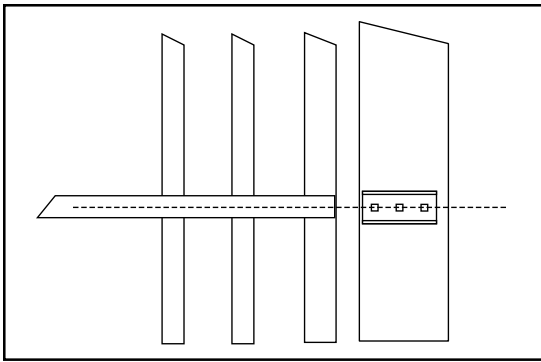
NOTE: If you have round metal gate posts that are 4" or 6" in diameter, optional mounting bracket adapters are available, see Accessory Catalog.

The use of optional mounting brackets adapters may require you to drill a few additional holes in the standard post bracket depending on your application.



Step 3:

Close the gate and place your level against the horizontal cross member. The top of the level should be in the center of the cross member and should overlap the fence post. Scribe a line across the cross member and fence post. You will use this line to help determine position of gate and post brackets.

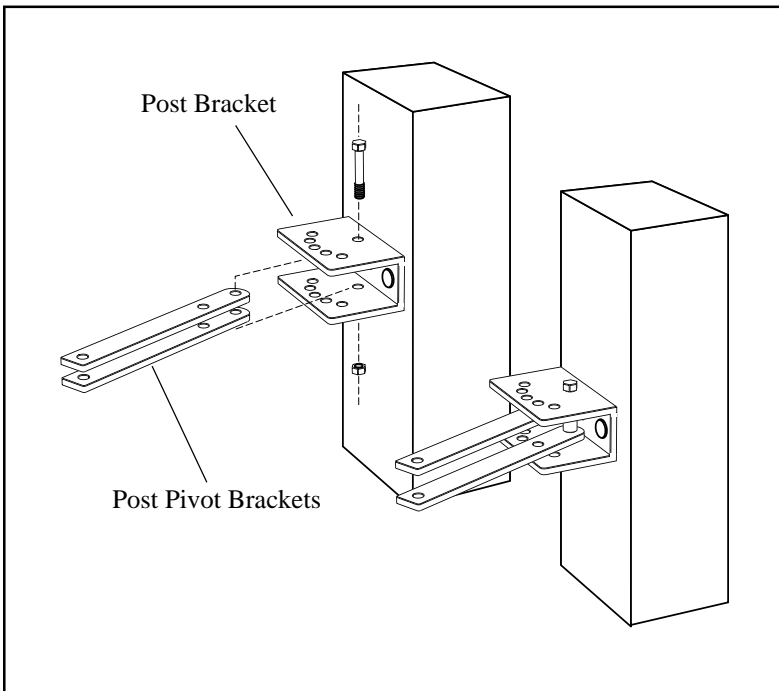
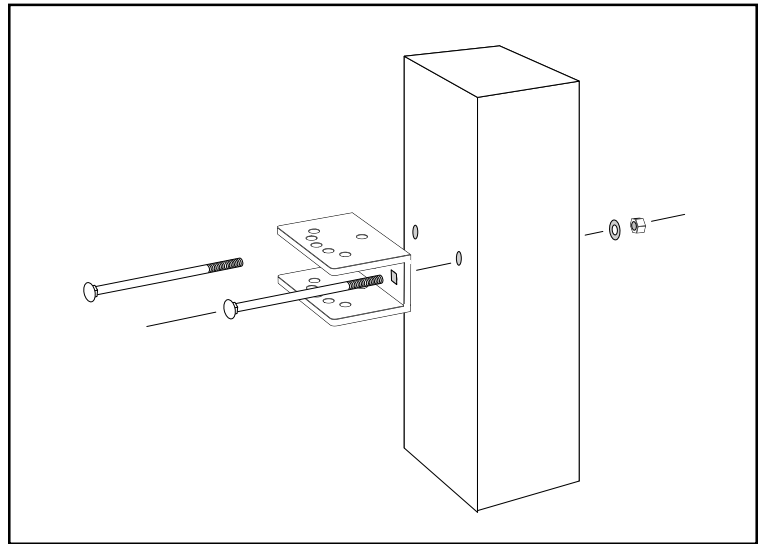


Step 4:

Position the post bracket on the fence post with the mounting holes centered over the scribe line. The post bracket should be flush with the edge of the fence post closest to the gate (see illustration). Mark the position of post bracket holes on the fence post.

Step 5:

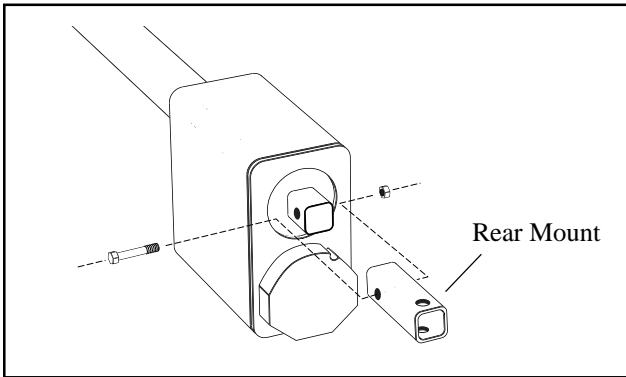
Drill holes in fence post as marked using a $\frac{1}{2}$ " drill bit. Install the post bracket using the $\frac{1}{2}$ " x 10" carriage bolts, $\frac{1}{2}$ " washers, and lock nuts (provided).



Step 6:

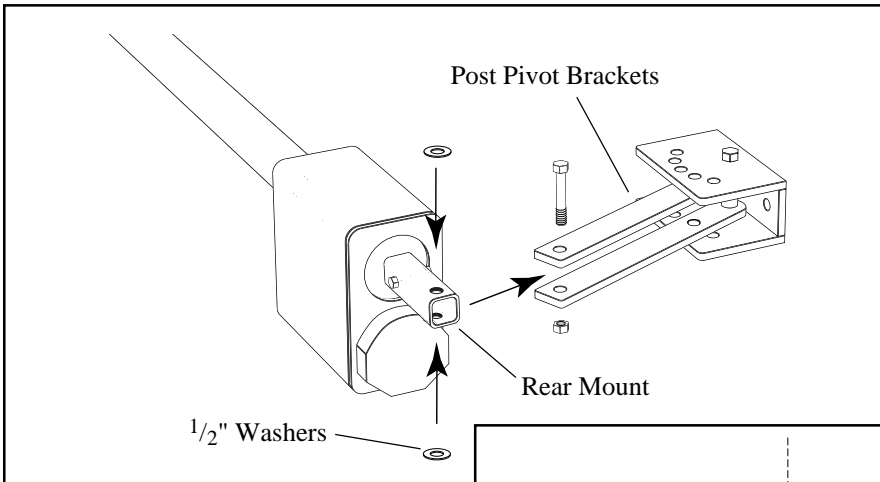
Place the rounded ends of post pivot brackets inside the post bracket. Align the holes in the post pivot brackets with holes in the post bracket (see illustration). Insert $\frac{1}{2}$ " x $3\frac{3}{4}$ " hex head bolt through post pivot brackets and post bracket; tighten the nut.

Connecting Operator to Post Bracket Assembly



Step 7:

Tap the rear mount onto the back of the operator. Align the $\frac{3}{8}$ " hole in the rear mount with $\frac{3}{8}$ " hole in the back of the operator and insert the $\frac{3}{8}$ " bolt through the holes and secure it with the lock nut.

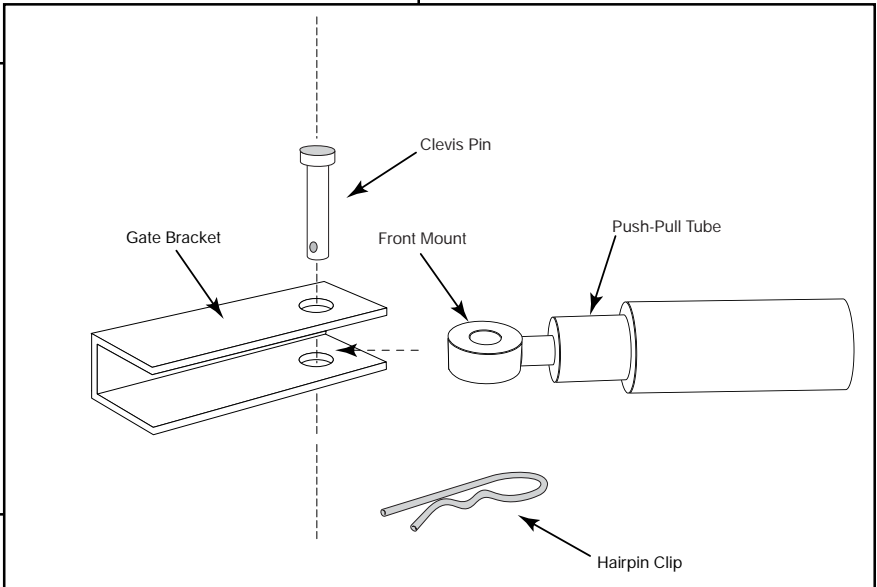


Step 8:

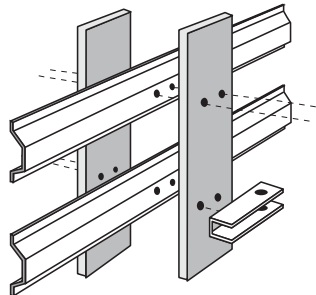
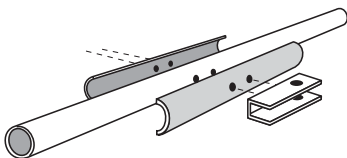
Position rear mount between post pivot brackets. Place $\frac{1}{2}$ " washers between rear mount and post pivot brackets. Align $\frac{1}{2}$ " hole in rear mount and washers with holes in post pivot brackets. Attach the rear mount to post pivot brackets using $\frac{1}{2}$ " x $2\frac{3}{4}$ " bolt and $\frac{1}{2}$ " nut. **Note: when tightening the rear mount bolt, leave it loose enough for the operator to pivot freely.**

Step 9:

Attach the gate bracket to the front mount using the clevis pin and hairpin clip.



IMPORTANT: Thin walled tube and panel gates **MUST** be reinforced as shown to prevent damage to gate and operator.

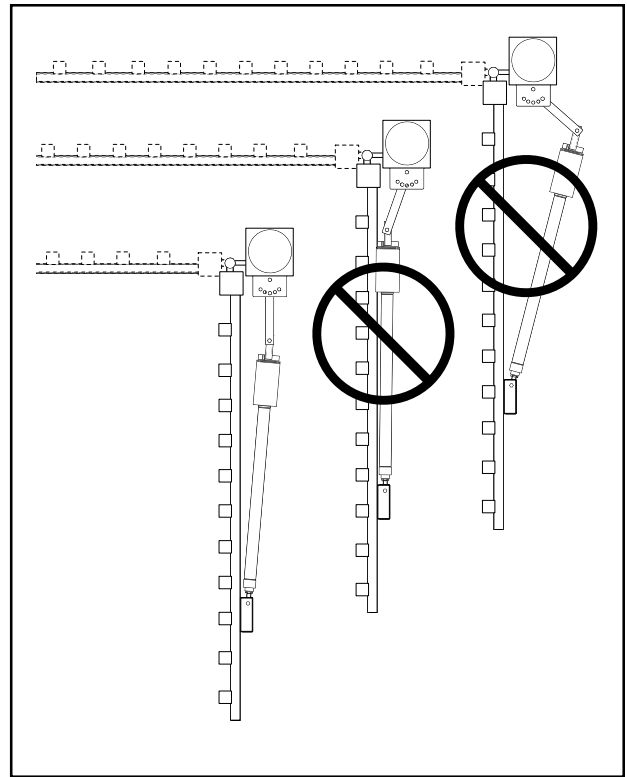
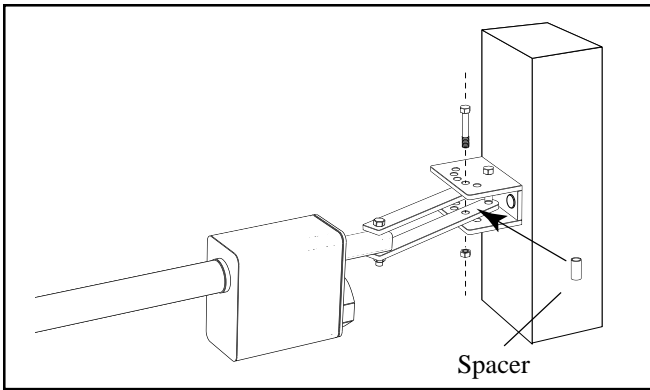


Step 10:

Open the gate to the desired position (at least 10° and no greater than 110°). Position the operator so that the gate bracket just rests against the gate. Check the clearance between the operator and the gate. The operator should only make contact with the gate at the gate bracket. However, there should not be too much clearance between the operator and the gate, or the operator will fully extend before it reaches the closed position. See illustration at right for examples of clearance.

Step 11:

Now align spacer and post pivot brackets hole with the post bracket hole that provides the best clearance. Insert the 1/2" x 3 3/4" bolt through holes in post bracket, post pivot brackets and spacer. When tightening the 1/2" nut, leave it loose enough so that you can make adjustments later.

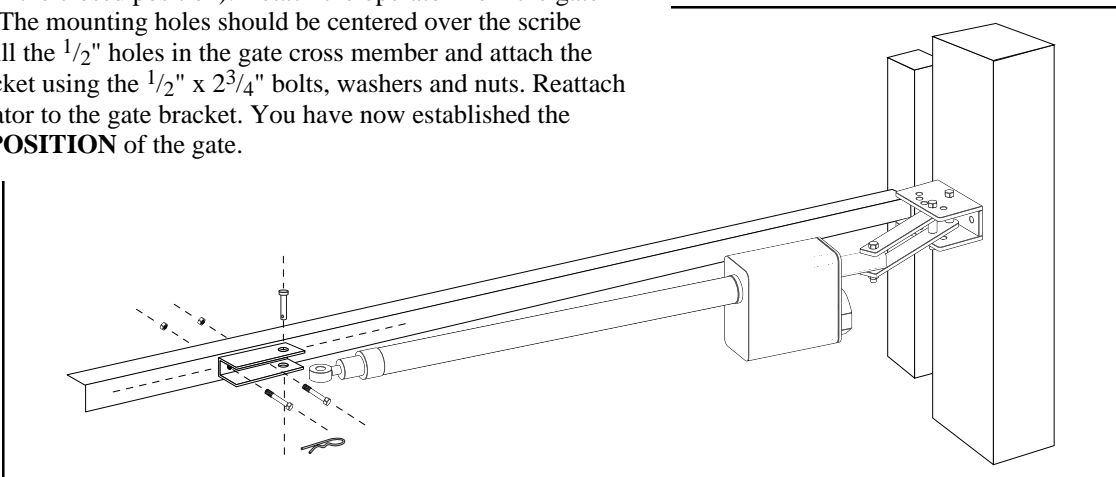
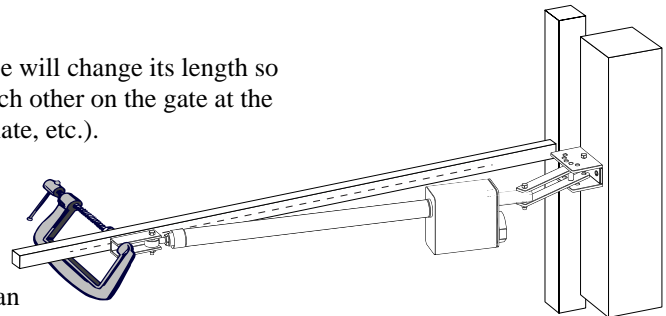


Installing the Gate Bracket

NOTE: Rotating the front mount at the end of the push-pull tube will change its length so that the mount and gate bracket can be properly aligned with each other on the gate at the best location (i.e. between or on pickets, on braces, mounting plate, etc.).

Step 12:

With the gate bracket clamped in the open position (no more than 110° from the closed position). Detach the operator from the gate bracket. The mounting holes should be centered over the scribe line. Drill the 1/2" holes in the gate cross member and attach the gate bracket using the 1/2" x 2 3/4" bolts, washers and nuts. Reattach the operator to the gate bracket. You have now established the **OPEN POSITION** of the gate.

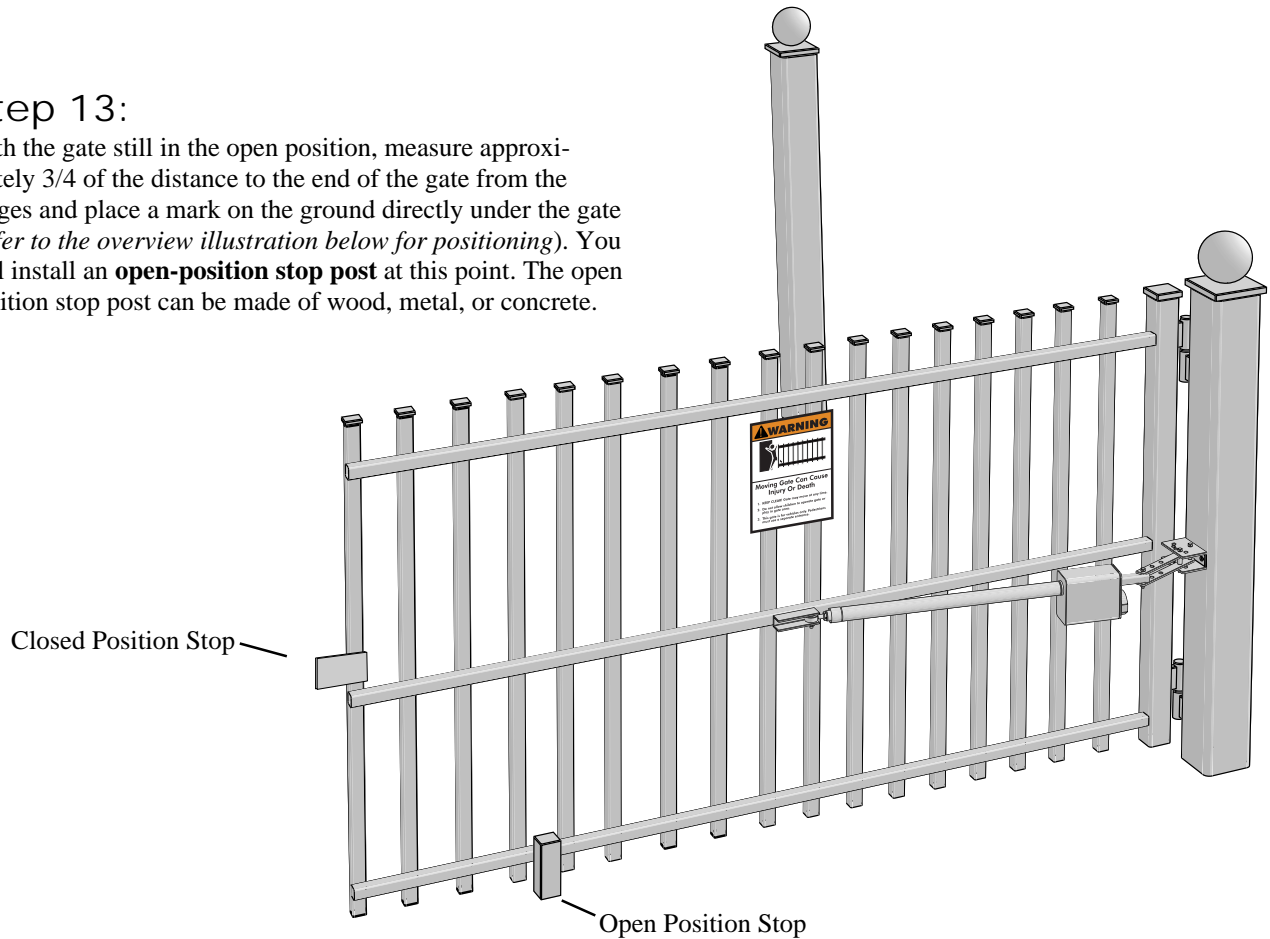


Installing the Open and Closed Position Stops

The positive stops hold the gate firmly in the open and closed positions. The positive stops also form the boundaries of the gate operating arc and help stabilize the gate. Moreover, a stable gate helps to maintain the long life of your automatic gate opener system. To further enhance the stability and security of your gate, install the optional **GTO Automatic Gate Lock** (see *Accessory Catalog*).

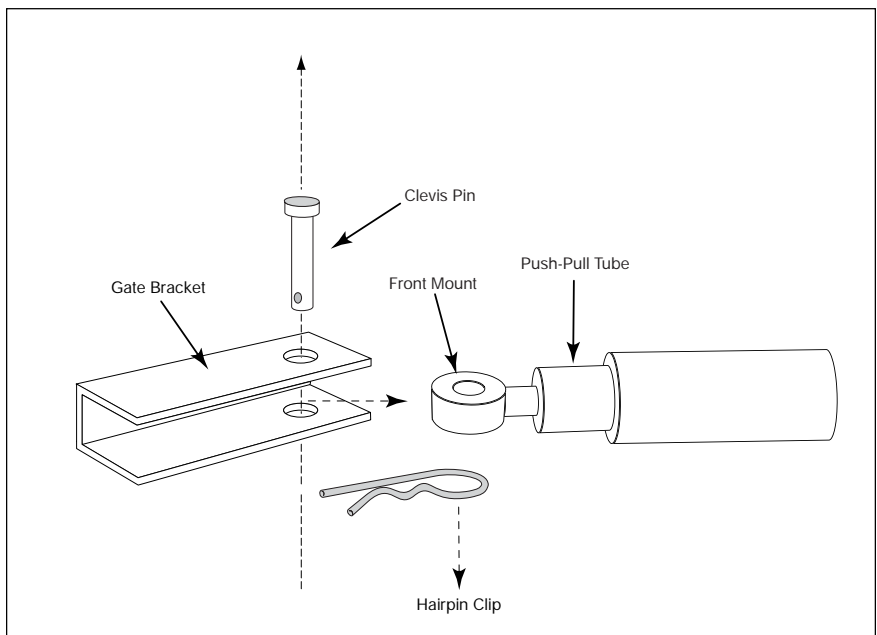
Step 13:

With the gate still in the open position, measure approximately 3/4 of the distance to the end of the gate from the hinges and place a mark on the ground directly under the gate (refer to the overview illustration below for positioning). You will install an **open-position stop post** at this point. The open position stop post can be made of wood, metal, or concrete.



Step 14:

Remove the hairpin clip and clevis pin from the gate bracket and move the gate so that you can install the open position stop post. Secure stop post in the ground (and seat in concrete).

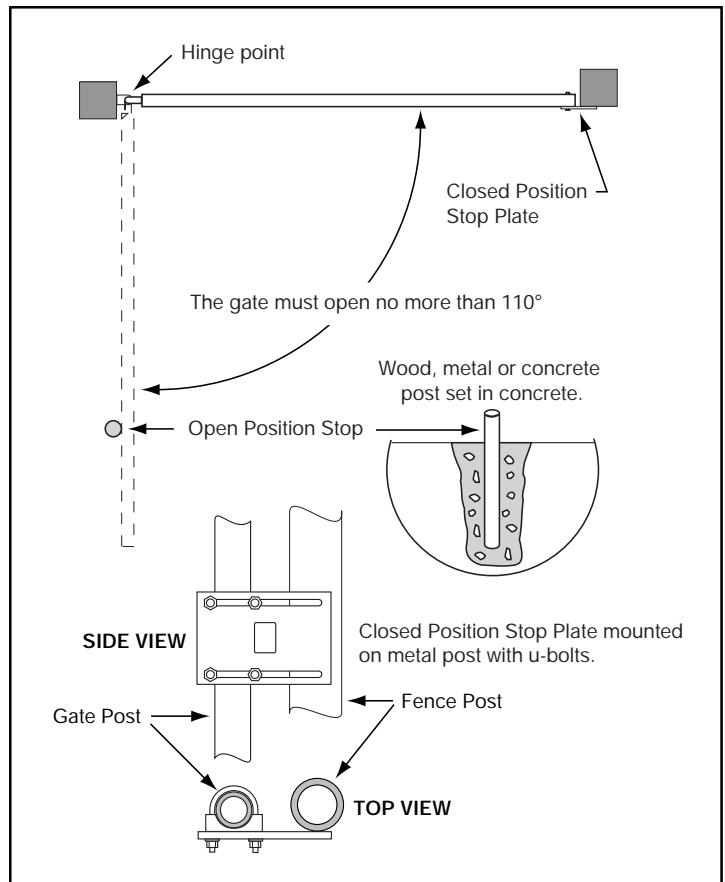


Step 15:

Close the gate. Position the closed position stop plate on the end of the gate frame at mid-height. Extend the stop plate to make contact with the fence post at that position.

Install the closed position stop plate using appropriate hardware for the type of gate (U-bolts for tube or chain link gate, wood or lag screws for wood gates, etc.). This hardware is not provided.

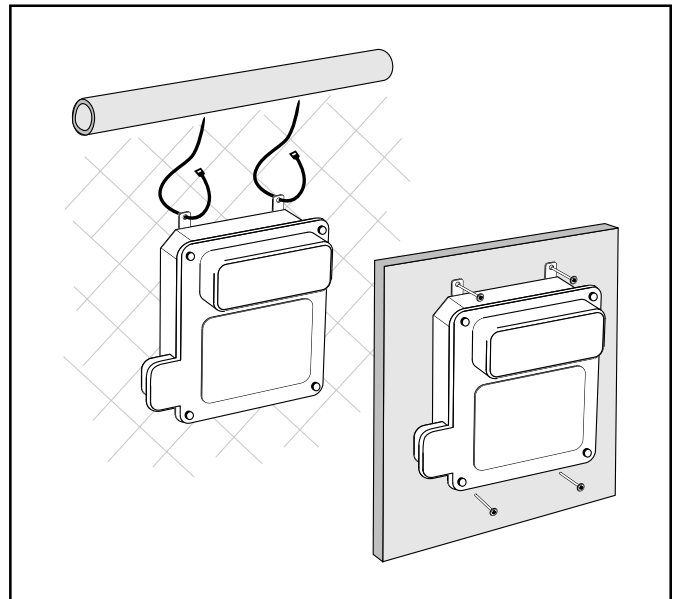
Reattach the operator to the gate bracket.



Mounting the Control Box

Step 16:

Mount the control box using the nylon cable ties (*provided*) or another secure mounting method. The control box must be mounted at least **3 feet above the ground** to protect it from rain splash, snow, etc., and at least **3 feet from an ac power source to prevent electrical interference**.

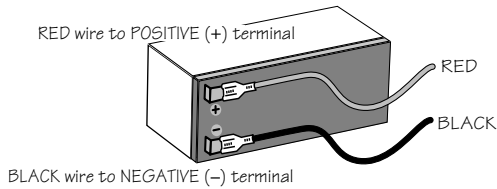


Step 17

Make sure the control box power switch is in the **OFF** position. Unscrew and remove the control box cover and slide the battery into position with its terminals to the **left** (see illustration). Push battery down until it fits snugly in control box. Connect the **BLACK** battery wire to the **NEGATIVE** (-) battery terminal. Connect the **RED** battery wire to the **POSITIVE** (+) terminal.

Pay close attention to the color of the wires. If the wires are connected incorrectly, the control board will be damaged.

NEVER insert the battery with the terminals to the right.

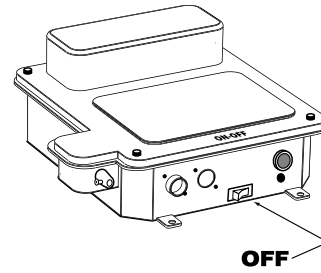
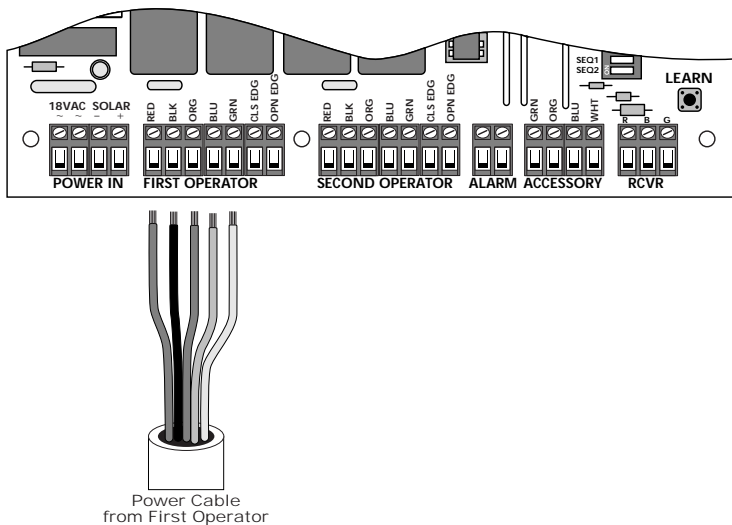


HINT: A dab of household petroleum jelly on the battery terminals will help prevent corrosion.

Step 19

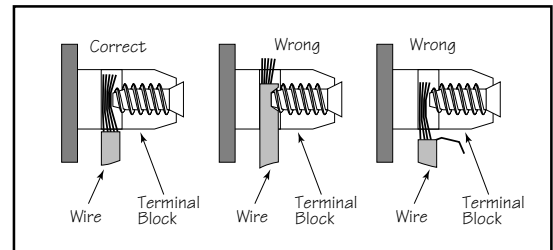
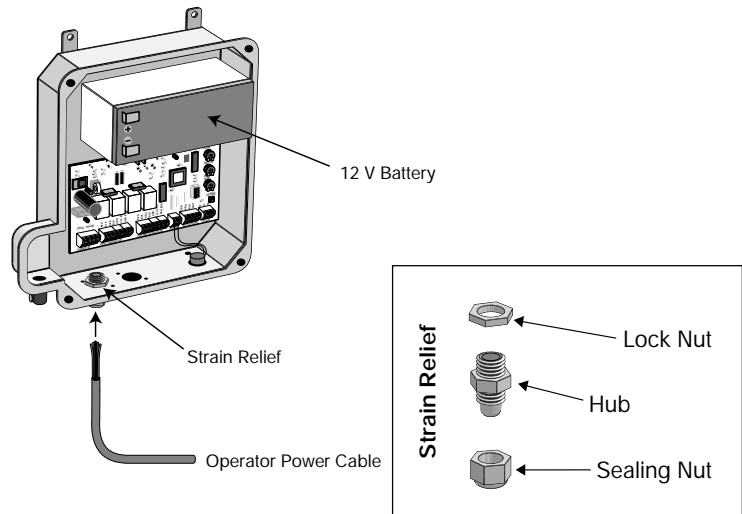
Insert the stripped power cable wires into the appropriate terminals on the **FIRST OPERATOR** terminal block. The green wire should be inserted into the **GRN** terminal, the blue wire into **BLU**, the orange wire into **ORG**, black wire into **BLK**, and the red wire into the **RED** terminal.

Tighten the set screws against the end of the wires. A dab of petroleum jelly on each terminal will help prevent corrosion.



Step 18

Strip approximately $\frac{3}{16}$ " of insulation from each wire of the power cable. Twist each exposed wire tightly (there are five [5] wires inside the power cable sheath). Remove lock nut from strain relief hub. Insert strain relief hub and sealing nut (along with power cable) into hole on bottom of control box. Thread approximately 4" of the power cable into the control box and retighten lock nut and sealing nut until the power cable locks into place.



Step 20: Verify that the control box power switch is OFF before proceeding to the next step!

Powering the System

- The transformer is intended for indoor use. If the transformer can only be plugged into an outside electrical outlet, a **weatherproof housing or cover** (available at electrical supply stores) **must** be used.
- **Solar power** options are available; see Solar Chart on next page.
- All low voltage wire used for powering the GTO/PRO gate operators **MUST** be 16 gauge (minimum) dual conductor, multi-stranded, direct burial wire.

Step 21:

Choose the electrical outlet into which the transformer will be plugged. Measure the distance from the electrical outlet to the control box, following the path where the low voltage wire will laid (**the maximum distance can be no more than 1000 ft.**).

Gate Weight	1000 lb.	160	150	140	130	120	110	100
	800 lb.	170	160	150	140	130	120	110
	600 lb.	180	170	160	150	140	130	120
	400 lb.	190	180	170	160	150	140	130
	200 lb.	200	190	180	170	160	150	140
		6-8 ft.	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.

NOTE: An operation cycle is one full opening and closing of the gate. The numbers shown in this chart are for single gate applications, cycles for dual gate applications will be about half of those with a single gate.

Predicting the exact maximum number of operational cycles at peak load is more of an art form than an exact science. The above chart illustrates the average maximum number of cycles possible (the “MNC”) in a 24 hour period with a single gate that is installed so that the motor moves the gate drawing 5 Amperes of current (typical installation on ball bearing hinges). Please keep the following variables in mind:

- 1) The MNC for the GTO/PRO 2000 is roughly comparable to most ac powered operators, and the transformer provided with this operator should handle most high traffic situations. If the battery does not seem to be able to provide the constant charge required for your application, the addition of the GTO Big Battery Kit (see Accessories on page 44) should provide ample power to handle any situation. For more information, call the GTO Service Department.
- 2) If the gate is binding, dragging in high winds, or if ball bearing hinges are not used, it will require more than 5 A to move it; this will reduce the MNC. Gates weighing less than 1000 lb. may have a higher MNC.
- 3) The above data is based on a line voltage of 120 Volts from an electrical outlet; if the outlet provides less than 120 Volts (for example, some rural areas may only provide 108 Volts), it can significantly reduce the MNC (as much as 50%).
- 4) **A fully charged battery has a reserve of 50-100 cycles without requiring a charge.** This allows peak loads at several points during the day, depending upon how much time the transformer has to provide a charge to the battery between cycles. The transformer is capable of fully recharging the battery in as little as five minutes at optimum conditions.
- 5) The above chart is based upon an ambient temperature of 40 °F. Battery performance and speed at which it will recharge will fluctuate based upon temperature.

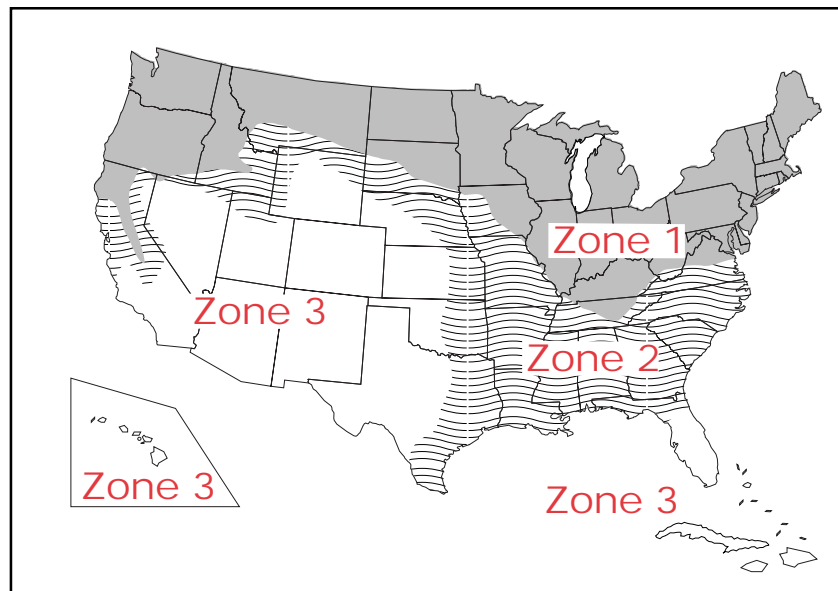
Solar Zones and Gate Activity

This table and map illustrates the maximum number of cycles per day to be expected in a particular area, using GTO's 10 watt solar panels (see *Accessory Catalog*). Figures are shown for **winter** (minimum sunlight) and do not account for use of any accessory items. Accessories will draw additional power from the battery.

Estimated Maximum Number of Cycles Per Day

Winter Ratings	Zone 1	Zone 2	Zone 3
PRO 2000 Single Gate (one panel)	4	8	13
PRO 2000 Single Gate (two panels)	8	16	26
PRO 2000 Dual Gate (two panels)	4	8	13

NOTE: A maximum of two 10 watt solar panels can be connected to the GTO/PRO 2000 series of operators.



Important Information About Low voltage Wire

The only wire acceptable for use with GTO products is 16 gauge (**minimum**) multi-stranded, low voltage, PVC sheathed wire. This particular gauge enables the transformer to provide an adequate charge through the control board to the battery at distances up to 1000 ft.

DO NOT use telephone wire or solid core wire. Unlike multi-stranded wire, these types of wire are inadequate for use with your gate opener system. Telephone wire and solid core wire do not deliver enough voltage for your gate operator to function and will cause the system to go into a condition known as "low voltage lockout."

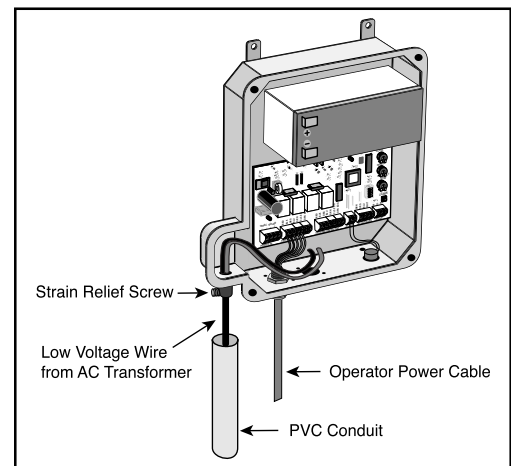
Never splice wires together. Splicing permits corrosion and seriously degrades the wire's ability to carry an adequate current.

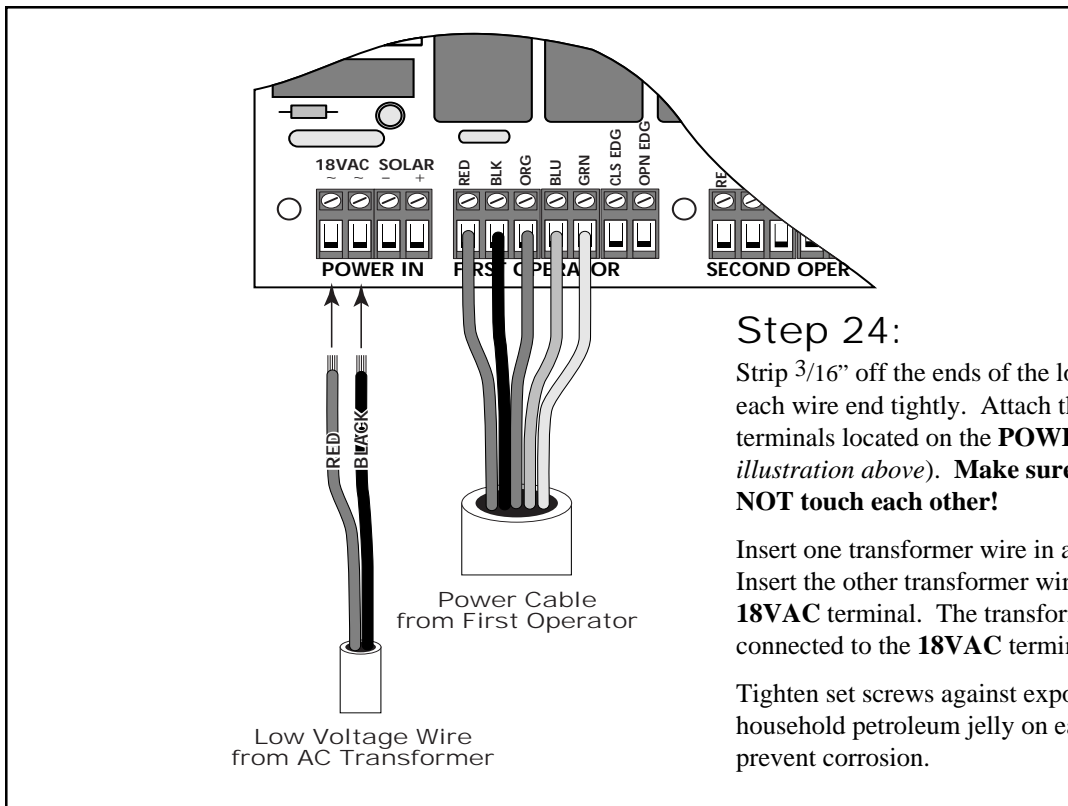
Step 22:

Install low voltage wire (see *Accessory Catalog*) to connect the control box to the transformer. This wire should be buried in a trench. Wires coming from the ground to the control box should be run through PVC conduit to protect them from lawn mowers, weed eaters and grazing animals. **Do not use telephone wire or any solid core wire. Never splice wires together!**

Step 23:

Feed the low voltage wires upward through the strain relief on the control box. Pull 6" to 8" of wire into the control box and tighten the screw on the side of the strain relief to secure wires.



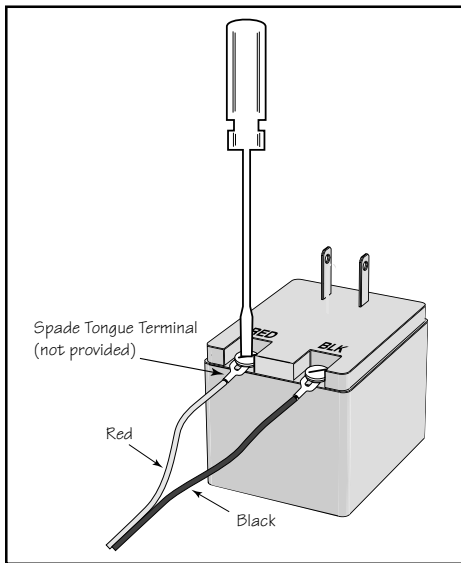


Step 24:

Strip $\frac{3}{16}$ " off the ends of the low voltage wire and twist each wire end tightly. Attach these ends to the **18VAC** terminals located on the **POWER IN** terminal block (see illustration above). **Make sure the exposed wires DO NOT touch each other!**

Insert one transformer wire in an **18VAC** terminal. Insert the other transformer wire into the remaining **18VAC** terminal. The transformer wires can be connected to the **18VAC** terminals regardless of color.

Tighten set screws against exposed wires. A dab of household petroleum jelly on each terminal will help prevent corrosion.



Step 25:

Strip $\frac{1}{2}$ " off the ends of the low voltage wire and attach ends to the transformer terminals; **red lead to RED, black lead to BLK.**

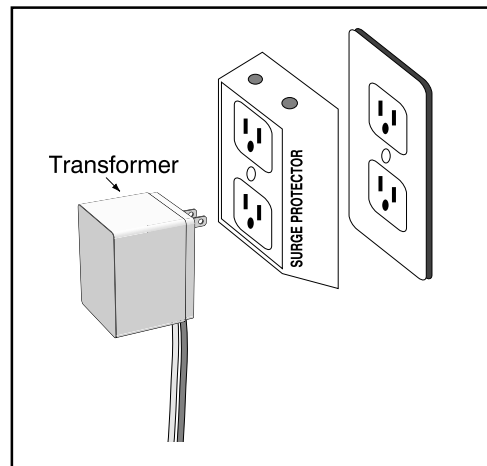
A dab of household petroleum jelly on each terminal will help prevent corrosion.

We recommend crimping a spade-tongue terminal (*not provided*) to the end of each wire before attaching it to the transformer.

Make sure the exposed wires DO NOT touch each other!

Step 26:

Plug in the transformer. **We strongly recommend using a surge protector with the transformer.**



HINT: Keep a few mothballs in the control box to discourage insects from entering it and damaging the control board.

CONTROL BOARD SETTINGS

DIP Switches

The four DIP switches on the control board match the operator with the type of gate on which it is installed. For example, gates may pull-to-open or push-to-open. Prior to packaging, the GTO/PRO 2000 series control board was configured for single swing gates that pull-to-open (open *into* the property). If your gate type matches this configuration, you **DO NOT** need to adjust the DIP switches; Proceed to the **Potentiometers** section on the next page.

NOTE: To change the DIP switch settings, you must turn the control box power switch OFF; move the switch; then turn the power back ON. Use a small screwdriver to move the switches.

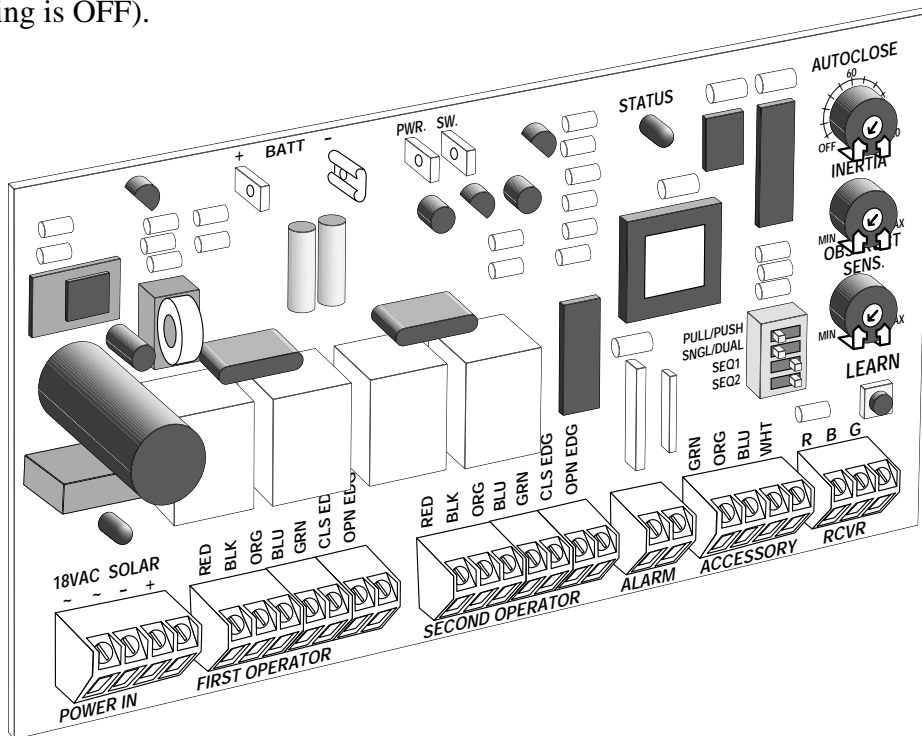
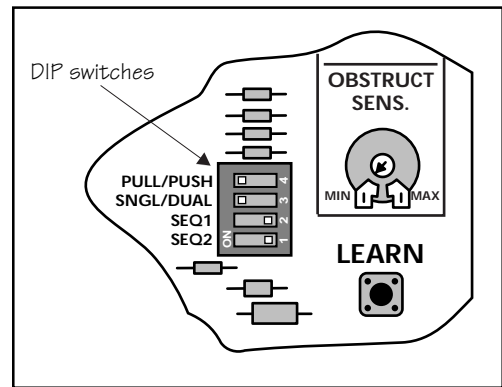
PULL/PUSH: Set to **PULL** for swing gates that pull-to-open [factory setting]; **PUSH** for swing gates that push-to-open (see **Push to Open Installation** on pages 31-32).

NOTE: The direction a gate opens is determined by standing inside the property and facing toward the gate.

SNGL/DUAL: Set to **SNGL** for a single gate leaf [factory setting]; **DUAL** for dual gate leaves.

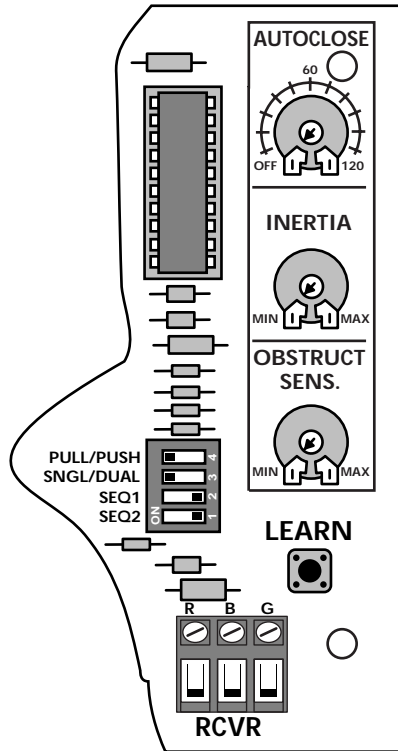
SEQ1: Controls the opening order of dual gate leaves. See **Dual Gate System Installation** on page 40 for more information. (the factory setting is OFF).

SEQ2: Controls the opening order of dual gate leaves. See **Dual Gate System Installation** on page 40 for more information (the factory setting is OFF).



Potentiometers

The three (3) potentiometers on the control board operate like a volume control on a radio. They control the auto close timer, inertia, and obstruction sensitivity of the operator. Use a small slotted screwdriver to turn the arrow in the center of the potentiometer. Clockwise rotation increases the setting (**MAX**). Counterclockwise rotation decreases the setting (**MIN**).



AUTO CLOSE (auto close timer): Determines how long the gate will remain open before it automatically closes. The limits are **OFF** to 120 seconds. The factory setting is **OFF**.

INERTIA: Fine tunes obstruction sensitivity in the opening and closing modes. **INERTIA** allows the opener to attempt to push an obstruction clear of the gate path. When **INERTIA** is set to **MIN** the opener will obstruct *quickly* (i.e., will attempt to push an obstruction briefly); when set to **MAX**, the opener will obstruct *slowly* (i.e., will push against an obstruction for a longer period). The factory setting is **MIN**.

OBSTRUCT SENS. (obstruction sensitivity): Determines the amount of *force exerted by the gate* on an obstruction before the operator stops and reverses. The gate will exert *minimum force* before obstructing when set to **MIN**. When set to **MAX**, the operator will exert *maximum gate force* before obstructing (i.e., the operator will require greater resistance before stopping and reversing.). The factory setting is **MIN**.

READ WARNING BELOW!

NOTE: Heavy gates and gates with high wind resistance *may* require the **OBSTRUCT SENS.** potentiometer to be set closer to **MAX** to prevent the operator from obstructing. Keep in mind, however, that while you must determine the best setting for *smooth* gate operation, you must **ALSO** determine the lowest possible setting for *safe* gate operation.

ALWAYS KEEP SAFETY AT THE TOP OF YOUR LIST WHEN ADJUSTING OR SERVICING YOUR AUTOMATIC GATE OPERATOR!



All three potentiometers were set to minimum at the factory. The **OBSTRUCT SENS.** potentiometer **MUST** be adjusted above the factory setting for your GTO/PRO 2000 series operator to function properly. If the potentiometer is left at **MIN**, your gate operator may "obstruct" (i.e., stop and reverse) as soon as it is activated.

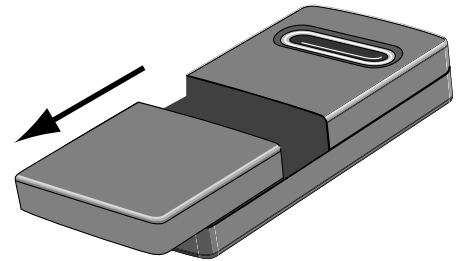
BE SURE TO PROPERLY RETEST THE GATE OPERATOR AFTER MAKING ANY ADJUSTMENTS; FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR DEATH.

Setting the Personal Transmitter Code

All GTO transmitters are set to a standard code at the factory and are ready to activate your automatic gate operator. For your safety and security, however, we **strongly recommend** that you replace the factory setting with your own personal code. Follow the directions below:

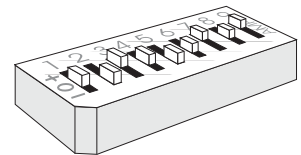
1. Remove the Transmitter Cover

Grasp the sides of the access cover and slide it away from the transmitter button (see illustration). When the access cover is removed, the battery and the DIP switches will be exposed. To set a new code, use a small screwdriver to move the switches.



2. Set the transmitter DIP Switches

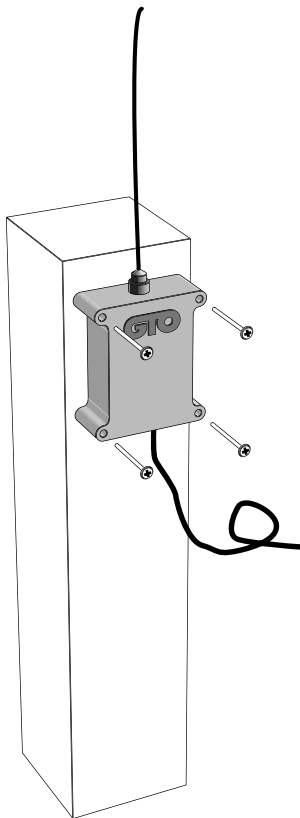
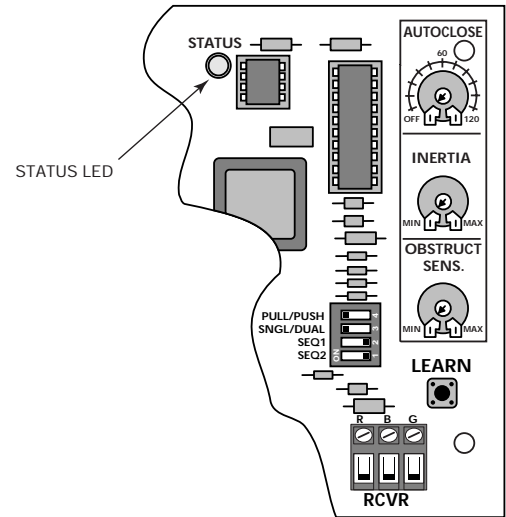
There are nine (9) transmitter DIP switches; each of which can be placed in three different positions (+, 0, -). **DO NOT** set all the switches in the same position, such as all +, all 0, or all -. Once the DIP switches have been set to a personal code, replace and close the access cover.



WARNING: No other adjustments should be made inside the transmitter.

3. "Teach" the New Code to Control Board Memory

- A. Turn control box power switch **OFF**.
- B. Unscrew and remove the control box cover.
- C. Press and hold the **LEARN** button on the control board, and turn the power switch **ON**. Release **LEARN** button. Wait 15 seconds for the receiver to charge.
- D. Press and hold transmitter button until the red **STATUS LED** comes **ON**.
- E. Release transmitter button. The new code is stored in control board memory.



Mounting the Receiver

Use the transmitter to check the range of the receiver before permanently mounting it.

Consider the following when mounting the receiver:

- Receiver cable length is 10 feet (receivers with a longer cable are available as special order items; *call the GTO Sales Department*). NEVER splice receiver cable!
- **Run the cable through PVC conduit to protect it from damage.**
- DO NOT run cable through metal conduit because the receiver signal range will be decreased.
- DO NOT run cable in conduit containing ac wiring.
- DO NOT mount receiver on a metal fence or post; doing so will decrease signal range.
- DO NOT overtighten the mounting screws; the receiver housing could be warped and the weather seal damaged.
- The receiver range can vary from 50 to 100 feet depending upon weather, topography, and external interference.

FCC Regulation

This device complies with FCC rules Part 15. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept an interference that may cause undesired operation.

Transmitter distance may vary due to circumstances beyond our control. **NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.**

Setting the Closed Position Limit Switch

Step 29:

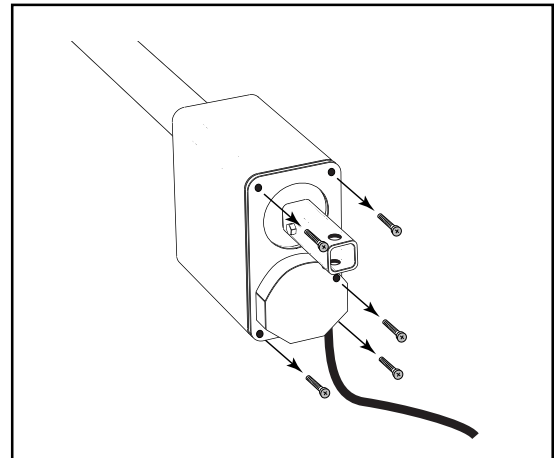
Remove the rear cover of the operator to gain access to the limit switches and the limit switch cams.

⚠ IMPORTANT: The *inner* switch cam assembly is factory set. Do not attempt to adjust the inner switch cam. This switch cam is not adjustable; attempting to move it will cause damage to the operator!

Step 30:

For Pull-to-Open Installations:

The open position of the gate was determined when you installed the GTO/PRO 2000 on the open gate (page 15, Step 12). The *outer* switch cam is used to adjust the **CLOSED POSITION** of the gate. The ideal closed position is when the closed position stop plate makes contact with the fence post just as the operator motor shuts down. Turn the cam until the desired setting is accomplished. Test adjustments by using transmitter.

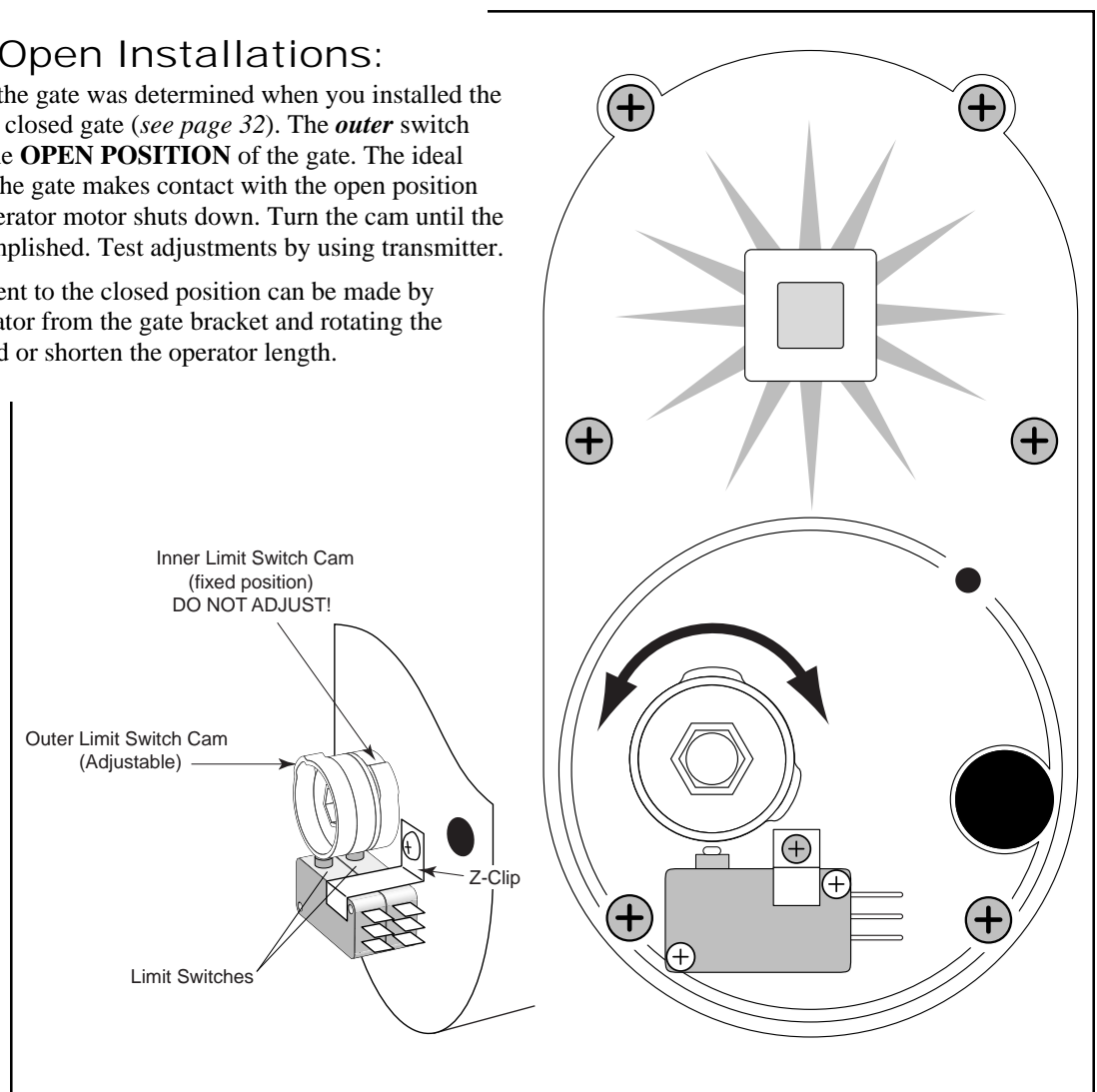


For Push-to-Open Installations:

The closed position of the gate was determined when you installed the GTO/PRO 2000 on the closed gate (see page 32). The *outer* switch cam is used to adjust the **OPEN POSITION** of the gate. The ideal open position is when the gate makes contact with the open position stop post just as the operator motor shuts down. Turn the cam until the desired setting is accomplished. Test adjustments by using transmitter.

NOTE: Some adjustment to the closed position can be made by disconnecting the operator from the gate bracket and rotating the push/pull tube to extend or shorten the operator length.

CAUTION: Because this operator is a powerful device, it is **extremely** important to properly set the limit switch. Keep the transmitter at hand during this operation in case you need to start or stop the operator to prevent harm to people or your gate.



Step 31:

Secure all bolts, nuts, and washers on the post bracket and gate bracket assemblies. Cut off the ends of the bolts extending beyond the tightened nuts.

Step 32:

Install warning signs on both sides of the gate (*see page 7*) using nylon cable ties (*provided*) or screws.

Connecting Additional Safety Devices

The GTO/PRO 2000 series operators are equipped with built-in obstruction sensitivity. These operators are designed to stop and reverse the gate for 2 seconds when it comes in contact with an obstruction. However, obstruction sensitivity, even when properly adjusted, *may not be sensitive enough to prevent bodily injury in some circumstances*. To augment protection against entrapment, GTO *suggests* using safety edge sensors or photoelectric sensors. When installed, safety edges (or photoelectric sensors) must be mounted in compliance with Underwriters Laboratories' safety standard for gate operators, UL 325. **Review page 4** for information about mounting requirements for safety edges ("contact sensors") and photoelectric sensors ("non-contact sensors").

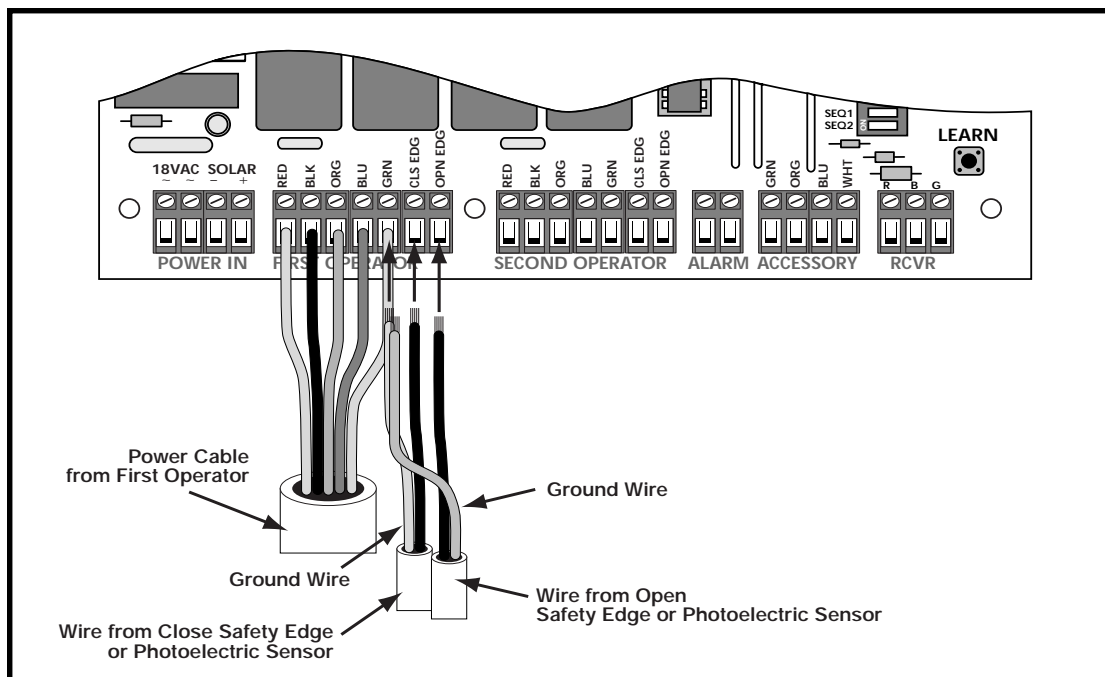
Refer to the sensor manufacturer's instructions for information about installing these devices on a vehicular gate.

⚠ Make sure the control box power switch is OFF before connecting safety device wiring to the terminal blocks.

Insert the safety device wires into the **CLS EDG** terminal (located on the **FIRST OPERATOR** terminal block) for the gate closing mode. Ground the safety device at the **GRN** terminal. Connect the safety device wires for the gate opening mode to the **OPN EDG** terminal in the same manner.

If you are installing a dual gate system, connect the safety devices wires to the CLS EDG and OPN EDG terminals on the **SECOND OPERATOR** terminal block as described above.

⚠ MAKE SURE TO GROUND THE SAFETY DEVICES AT THE GRN TERMINAL! THE CONTROL BOARD COULD BE DAMAGED IF THE SAFETY DEVICES ARE NOT GROUNDED!



Compatible Safety Devices

Although GTO **strongly recommends** the use of safety devices, we do not endorse any specific brand names. Below is a list of some products compatible with GTO operators systems, some of which require their own power supply. Check with the individual manufacturer for specific power needs.

Only use products that are certified and listed to be in compliance with national and regional safety codes.

Safety Edges

Miller Edge, Inc.

- MC-22
- ME-110 through 113
- ME-120
- ME-123
- MG-020
- MT-21 and 22
- MU-22

Tapeswitch Corporation

- 101-B and BMT
- 102-A, B, BP, BPH
- 107-RS and LS
- 121-BP
- 131-A and AMT
- 141-BMH
- 191-S
- IL

Photoelectric Beams

Texas Optoelectronics, Inc.

- Industrial Photobeam

EMX Industries, Inc.

- IRB-4X

NOTE: This is not an exhaustive list of compatible safety devices.

Connecting Accessories

Make sure the control box power switch is OFF before connecting accessories.

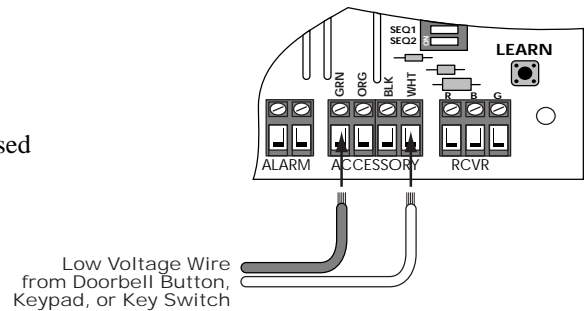
The **ACCESSORY** terminal block is the connection point for accessories such as push buttons, safety loops, intercoms, etc. The **ACCESSORY** terminal marked **GRN** (green) is the common ground for all accessories. **GRN** is paired with the terminals shown below when connecting accessories to the control board.

IMPORTANT: Make sure to twist exposed wires tightly and insert them into the terminals without loose strands. Tighten set screws against exposed end of wires. A dab of household petroleum jelly in each terminal will help prevent corrosion.

WHT (white) used with GRN (green):

Functions as a normally open contact. This is the most frequently used pairing for a doorbell button, keypad, or key switch.

- First contact will start the gate.
- Second contact will stop the gate.
- Third contact will reverse the gate.



NOTE: Never use a lighted doorbell button!

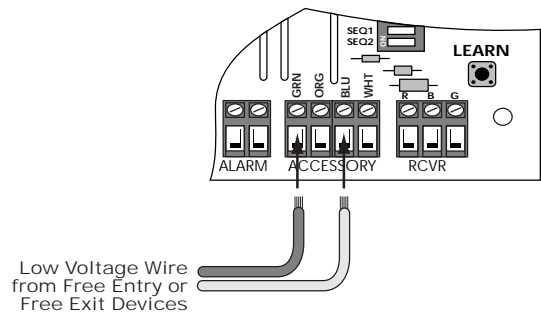
It will discharge the battery and the gate operator will fail to operate.

BLU (blue) used with GRN (green):

Functions as a normally open contact. This pairing is typically used for free entry and free exit devices.

- First contact will open the gate.

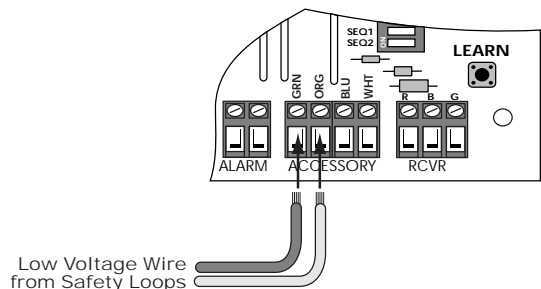
NOTE: If the gate is in the open position and begins to close, the activation of the accessory device will reopen the gate. In communities where the use of an emergency entry device is mandatory, it should be connected to these terminals.



ORG (orange) used with GRN (green):

Functions as a normally open contact. This pairing is frequently used for safety loops.

This connection will not open your gate. The safety loop will activate *only while the gate is in use*. When using this combination, the gate will remain open or reopen if it is closing.



Push-to-Open Installation

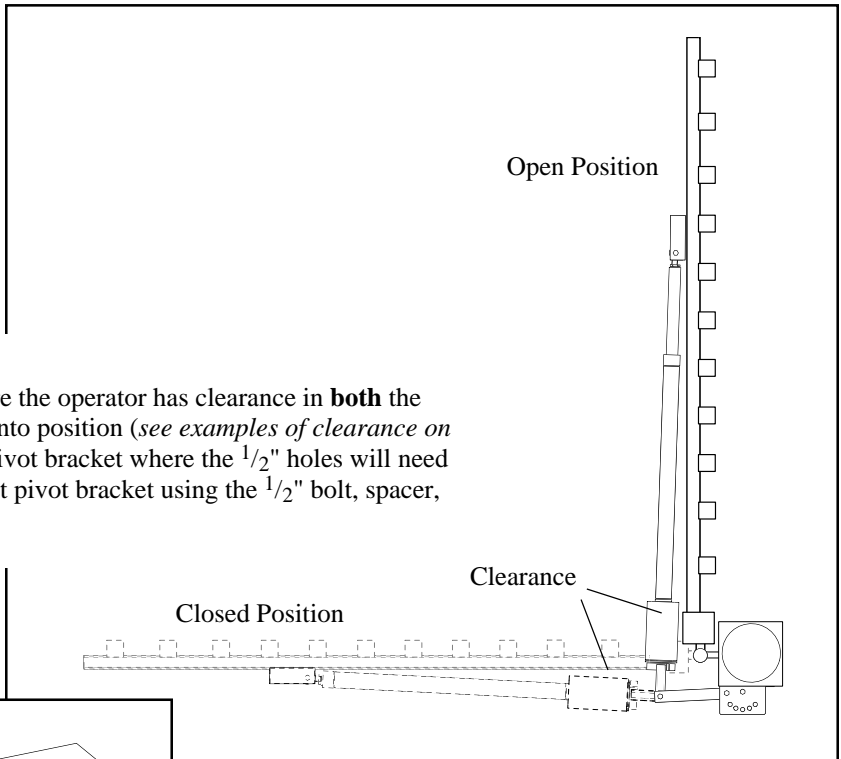
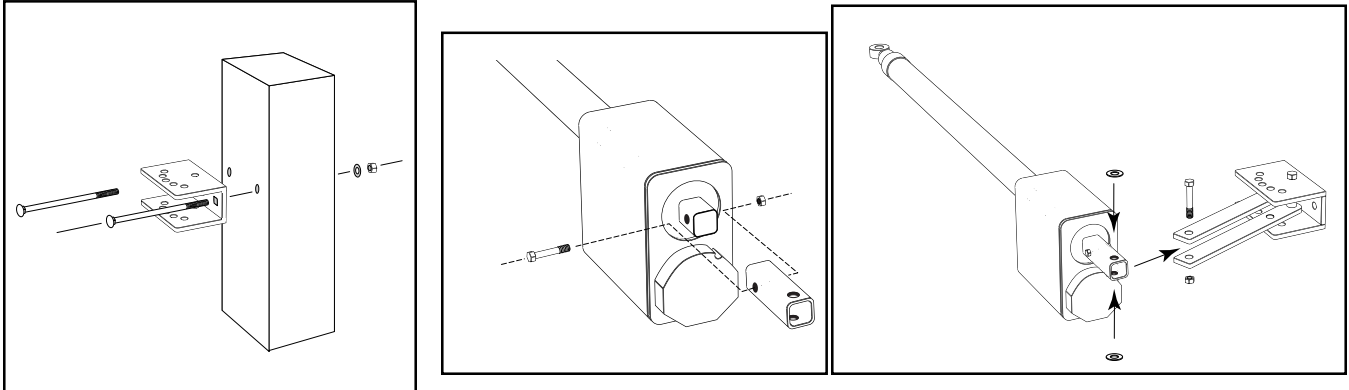
Determining The Mounting Position of The Post Bracket Assembly

⚠ Swinging gates shall not open into public access areas! Review IMPORTANT SAFETY INSTRUCTIONS

A "Push-to-Open" gate opens out from the property. The operator is installed on this type of gate while in the **closed** (not open) position. Because every gate installation varies, the push-to-open installation of the GTO/PRO 2000 and GTO/PRO 2200 will need to be customized. In most cases this only requires drilling two new holes in the post bracket.

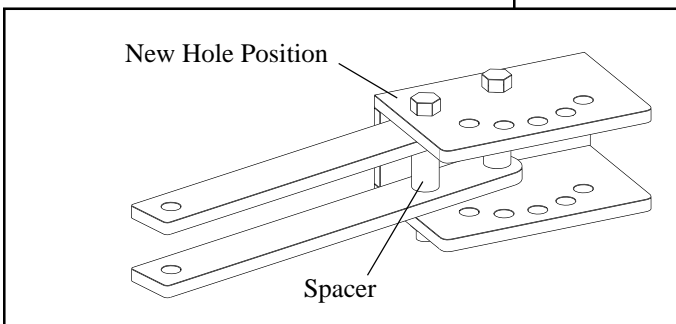
Step PTO-1:

The operator and brackets are installed on the gate post in the same way as pull-to-open installations. The post bracket is mounted at the inside edge of the post. The post pivot brackets are attached with one bolt at the pivot point and the operator(s) is attached at the rear mount. *See pages 11-14, Steps 1-9 for details.*



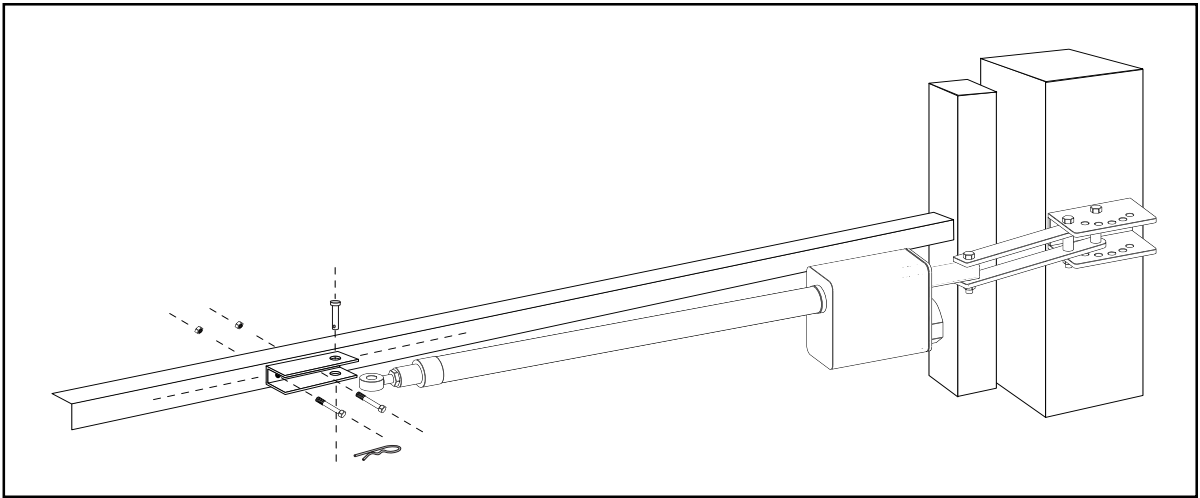
Step PTO-2:

Find a position for the post pivot brackets where the operator has clearance in **both** the open and closed positions and clamp operator into position (*see examples of clearance on page 15; step 10*). Mark the point on the post pivot bracket where the $\frac{1}{2}$ " holes will need to be drilled. Drill the holes then secure the post pivot bracket using the $\frac{1}{2}$ " bolt, spacer, washer and lock nut.



Step PTO-3:

With the gate in the closed position, connect operator to gate bracket assembly as in Step 12 on page 15 and clamp into position. Mark the point where the gate bracket will be attached to the gate. Drill the holes and mount the gate bracket. Reattach gate bracket to arm with clevis pin and hairpin clip.



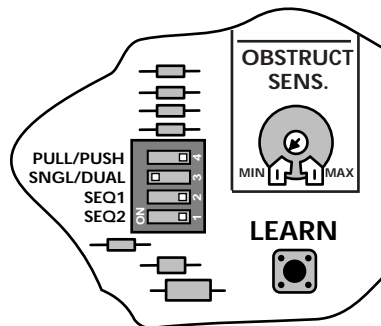
Step PTO-4:

Now go back and follow the instructions for the rest of the installation from **Installing the Open and Closed Position Stops** (see step 13-15).

Step PTO-5:

After you have installed the positive stops, the control board must be adjusted to accommodate the push-to-open gate.

Make sure the control box is **OFF**. Use a small screwdriver to move the **PULL / PUSH** DIP switch to **PUSH**. Replace control box cover. Turn Power switch **ON**. The control board is now configured to *push* the gate open.



Step PTO-6:

Press the transmitter to activate the operator and determine the degree the gate opens. If the operator does not shut down within one-half second of striking the open position stop (or does not contact the stop at all), you must adjust the limit switch for the push-to-open installation. *Turn to page 26 and refer to step 30 for instructions on setting the limit switch.*

⚠ DO NOT attempt to move the inner limit switch cam. This switch cam is not adjustable; attempting to move it will damage the operator!

Maintenance and Troubleshooting Guide

Maintenance:

- On all gates weighing 250 lb. or more, routinely grease the ball bearing hinges at least 4 times a year; more frequently if the gates are near a coastal area.
- A few mothballs in the control box helps to keep out insects which can damage circuits.
- Apply silicone spray to the push-pull tube at least once per month.
- Test all the safety devices once per month! If they are not working, contact your installer or The GTO Service Department

Gate force adjustments regulate the amount of force the operator uses to move the gate. If the hinges are in good working condition, try setting the **OBSTRUCT SENS.** potentiometer between MIN and MAX. In an area with high winds, the **OBSTRUCT SENS.** potentiometer will need to be set *closer to MAX.*

The operator has a 12 Vdc motor with mechanical limit switches.

To test the motor, put a voltmeter on dc and place the meter leads on the wire connections inside the plastic cover above the switches. The reading should be at least 11.5 V when the system is active. If it is not, see **The control board** section below.

To test the switches, put the meter on Ω (ohms). Place the leads on each of the wires on the switch. You should have an open circuit. Click the switch and you should have 0.2 . Do this for both switches.

To test the power cable, put the meter on Ω (ohms). At one end of the cable, place the lead on the green wire. At the other end, place the lead on the green wire and the other wires. The test should yield a maximum of 1.0 Ω on the green wire, and 0 Ω on the other wires. Test each wire as you have above. If all wires have the proper readings, then the power cable is not the problem.

NOTE: Inspect the cable for any signs of any punctures. Wires inside the black sheath can be shorted and the cable will indicate the correct resistance (ohms).

The control board: This is a microprocessor board. The power that runs the gate operator originates from the battery, which is recharged through the board by a 18 Vac (40 VA; 2.9 A) transformer.

There is one (1) green and one (1) red LED (light emitting diode) on the control board. They are for a quick reference only. All readings must be measured with a voltmeter!

The red LED serves two purposes. The first is to indicate that the transmitter code is stored (or being stored—see **Setting the Personal Transmitter code**, page 24). The second is to show the condition of the battery. If it is flashing, see the following section on **Testing the battery**. During normal operation the RED LED is **ON**.

If the red LED is flashing it indicates the system may have reached *low voltage lockout*, which means that the unit does not have enough voltage to operate the system. One of the following problems may exist:

- Incorrect type of wire is connected, or the wrong gauge wire is being used for the distance to the battery and the number of cycles that you desired. **See chart on page 19**
- Wires from the transformer or solar panel to the control board are broken or spliced.
- A transformer or solar panel has no output voltage.
- Incorrect number of solar panels, or solar panels connected improperly.

The green LED gives a visual indication that the control board is receiving power from the transformer.

The transformer: Two things can cause failure. The first is shorting the leads during the installation, or letting the strands touch at the terminal on the control board. The second is a static charge (generally associated with a lightning storm or power outage); use of a surge protector will help protect the transformer against static charges.

Testing the battery: This is a 12 V, 7 Ah battery. The proper way to test the battery is to perform a load test. Place the voltmeter on dc; put the red probe on the (+) positive terminal and place the black probe on (-) negative terminal. Activate the unit and monitor the voltmeter. The voltage drop should not be more than 1.0 V.

Note: A loose battery terminal will cause the same symptoms that a bad battery will cause. Terminals should be secure and corrosion free.

Remote control range: Varies with each installation. (*see FCC disclaimer on page 25*), the range of this device can vary from 50 to 100 feet, depending upon weather, topography and outside interference.

Make sure that the receiver is located above metal fences.

Moving the receiver even a few inches can change the range of operation.

Move the receiver as far from the motor as possible to avoid the chance of electrical interference.

Check or change the battery in the transmitter.

**The GTO, Inc. Technical Service Department is open
Monday – Thursday 7:30 A.M. – 5:30 P.M.
and Friday 8:00 A.M. – 12:00 P.M. (Eastern Time)
Telephone (850) 575-0176 • Fax (850) 575-8950
GTO Web Site: www.gtoinc.com • E-mail: techsupport@gtoinc.com**

Warranty and Repair Service

If the GTO gate operator system is not operating properly, please follow the steps below:

1. First, check the Maintenance and Troubleshooting Guide (*see page 33*).
2. Call your dealer or installer for assistance.
3. If your dealer or installer is unable to resolve the problem, call the GTO Service Department at (850) 575-0176 to discuss the problem with a service technician. Refer to the serial number (located on the control box cover) and date of purchase when calling for assistance.
4. If repair or replacement is necessary, you will be assigned a **Return Goods Authorization Number (RGA)**.
5. Carefully pack the component(s) authorized for return and ship freight prepaid to:
GTO, Inc., 3121 Hartsfield Road, Tallahassee, Florida, USA 32303.

NOTE: GTO products returned **without an RGA Number** (on the outside of package in **LARGE BOLD PRINT**) or **shipped freight collect WILL NOT** be accepted by the factory.

6. If the repair service or replacement *is covered by the warranty*, GTO, Inc. will pay shipping costs (equal to United Parcel Service ground rate) for return to owner.



Limited Two Year Warranty

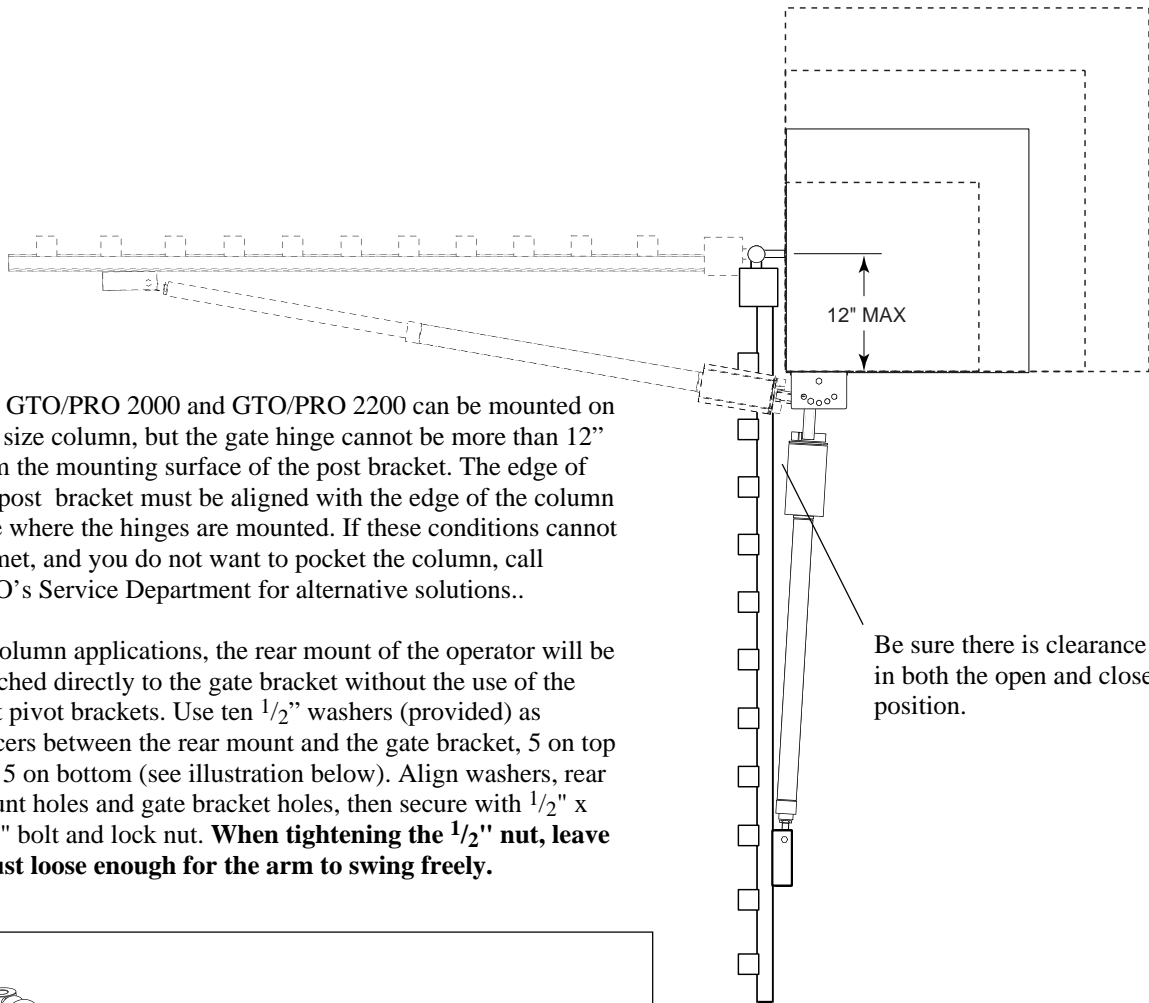
GTO/PRO 2000 series automatic gate operators are warranted by the manufacturer against defects in materials and manufacturer workmanship for a period of two (2) years from the date of purchase, ***provided recommended installation procedures have been followed.***

In the case of product failure due to defective material or manufacturer workmanship within the two (2) year warranty period, the operator will be repaired or replaced (at the manufacturer's option) at no charge to the customer, if returned freight prepaid to GTO, Inc., 3121 Hartsfield Road, Tallahassee, Florida, USA 32303. **IMPORTANT: Call (850) 575-0176 or Fax (850) 575-8950 for a Return Goods Authorization (RGA) number before returning to factory.** Products received at the factory without an RGA number will not be accepted. Replacement or repaired parts are covered by this warranty for the remainder of the two (2) year warranty period or six (6) months, whichever is greater. GTO will pay the shipping charges (equal to United Parcel Service ground rate) for return to the owner of items repaired under warranty.

The manufacturer will not be responsible for any charges or damages incurred in the removal of the defective parts for repair, or for the reinstallation of those parts after repair. This warranty shall be considered void if damage to the product(s) was due to improper installation or use, tampering, connection to an improper power source, or if damage was caused by lightning, wind, fire, flood, insects or other natural agent. This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. This warranty is in lieu of all other warranties, expressed or implied. **NOTE: Verification of the warranty period requires copies of receipts or other proof of purchase. Please retain these records.**

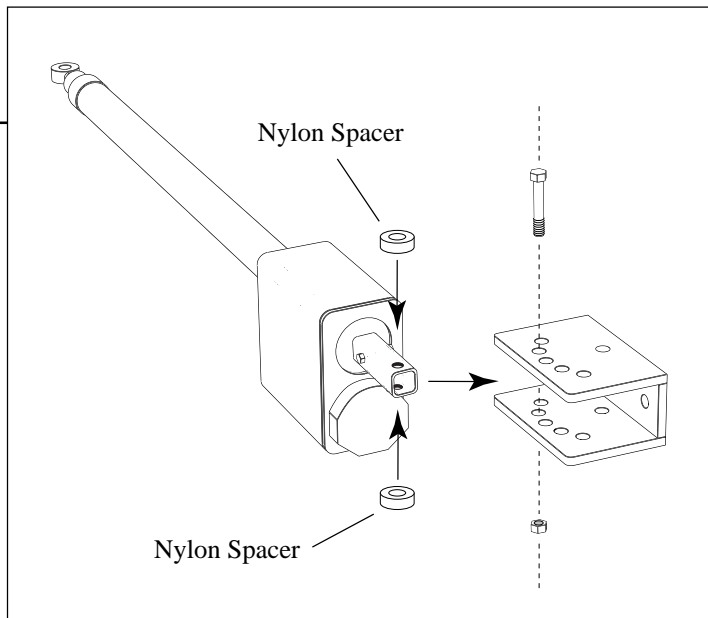
After the two (2) year warranty period has expired, GTO or one of its authorized service centers will make necessary repairs for a nominal fee. Call GTO at (850) 575-0176 for more information.

Column Installation Information



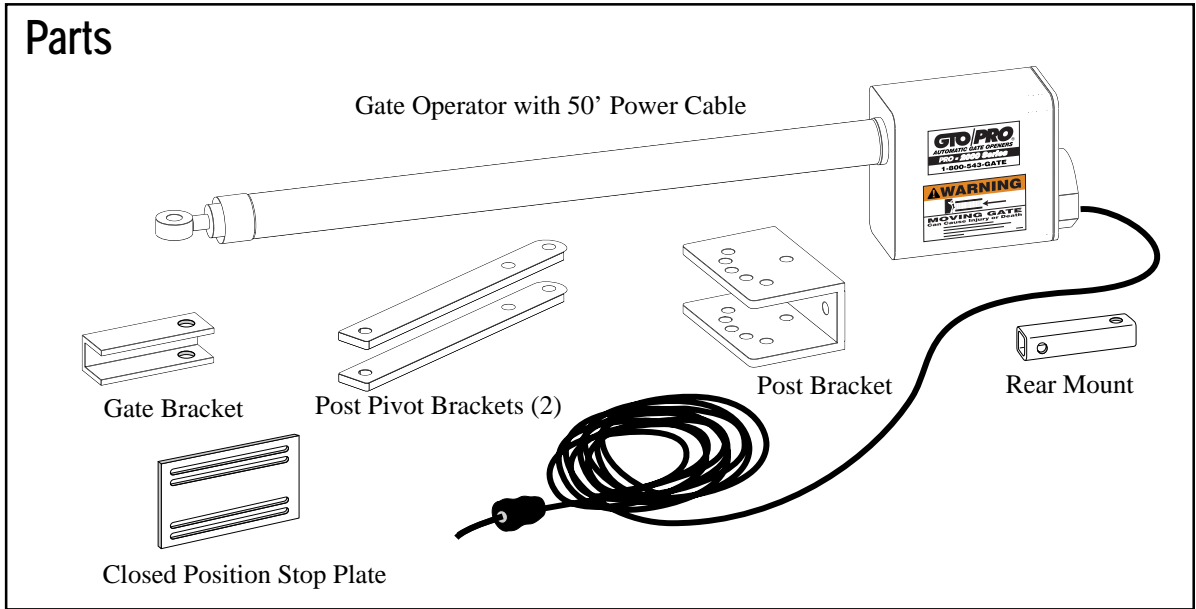
The GTO/PRO 2000 and GTO/PRO 2200 can be mounted on any size column, but the gate hinge cannot be more than 12" from the mounting surface of the post bracket. The edge of the post bracket must be aligned with the edge of the column face where the hinges are mounted. If these conditions cannot be met, and you do not want to pocket the column, call GTO's Service Department for alternative solutions..

In column applications, the rear mount of the operator will be attached directly to the gate bracket without the use of the post pivot brackets. Use ten $\frac{1}{2}$ " washers (provided) as spacers between the rear mount and the gate bracket, 5 on top and 5 on bottom (see illustration below). Align washers, rear mount holes and gate bracket holes, then secure with $\frac{1}{2}$ " x $3\frac{3}{4}$ " bolt and lock nut. **When tightening the $\frac{1}{2}$ " nut, leave it just loose enough for the arm to swing freely.**

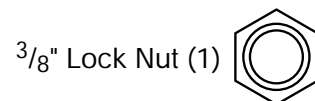
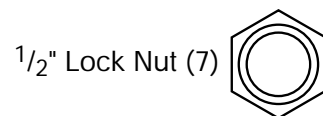
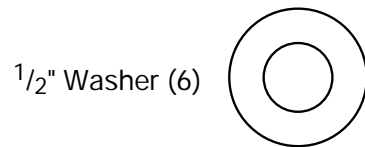
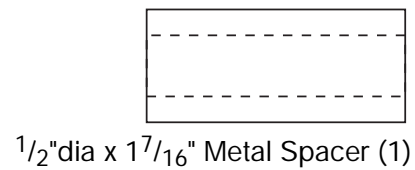
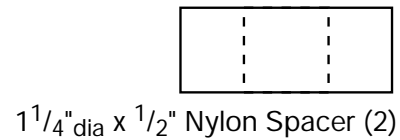
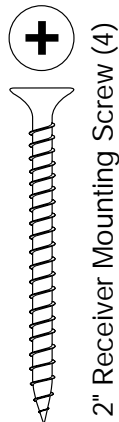
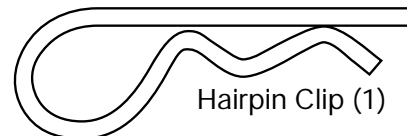
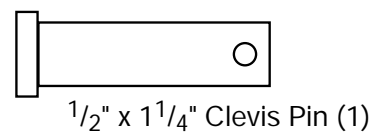
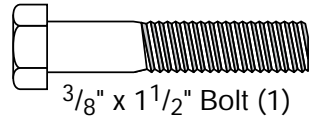
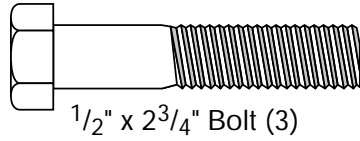
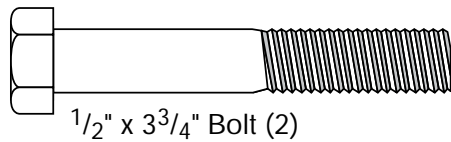
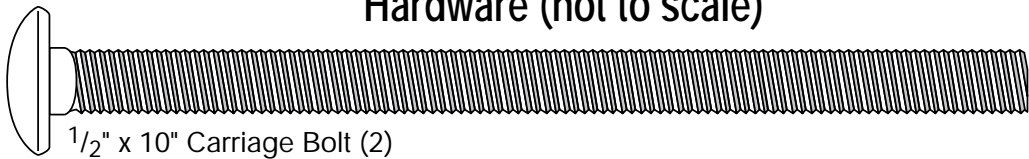


GTO/PRO 2200 Dual Gate System

Second Unit Parts List



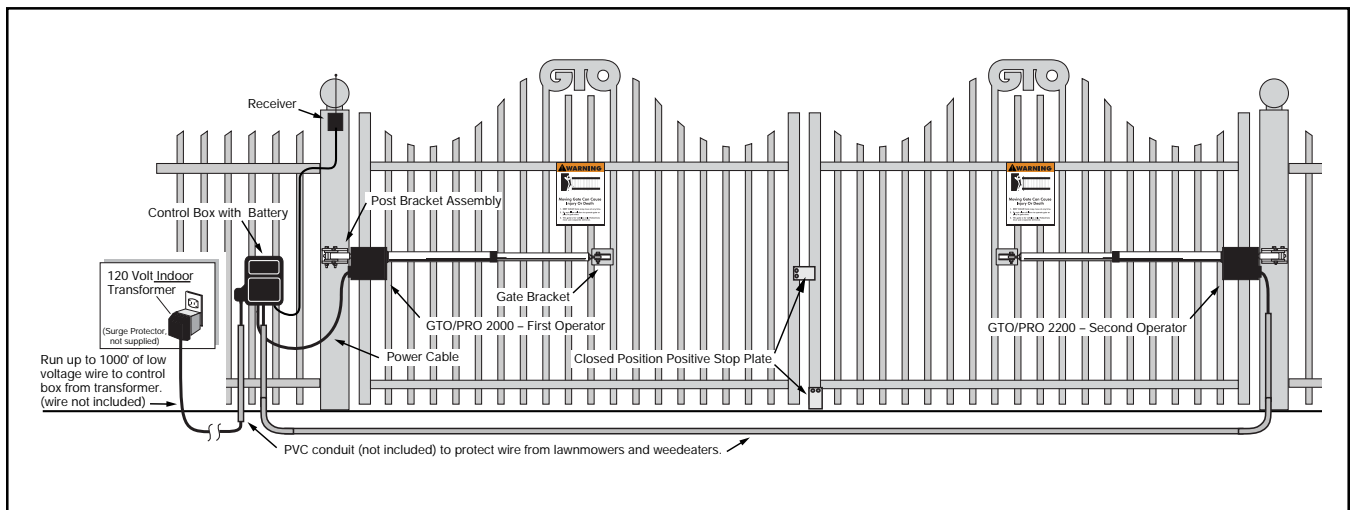
Hardware (not to scale)



Installing The Second Unit

The diagram below shows a dual gate, pull-to-open (gate opens into the property) installation on iron gates.

If you are installing a Push-to-Open (gate opens out) system see Push-to-Open Installation starting on page 31.

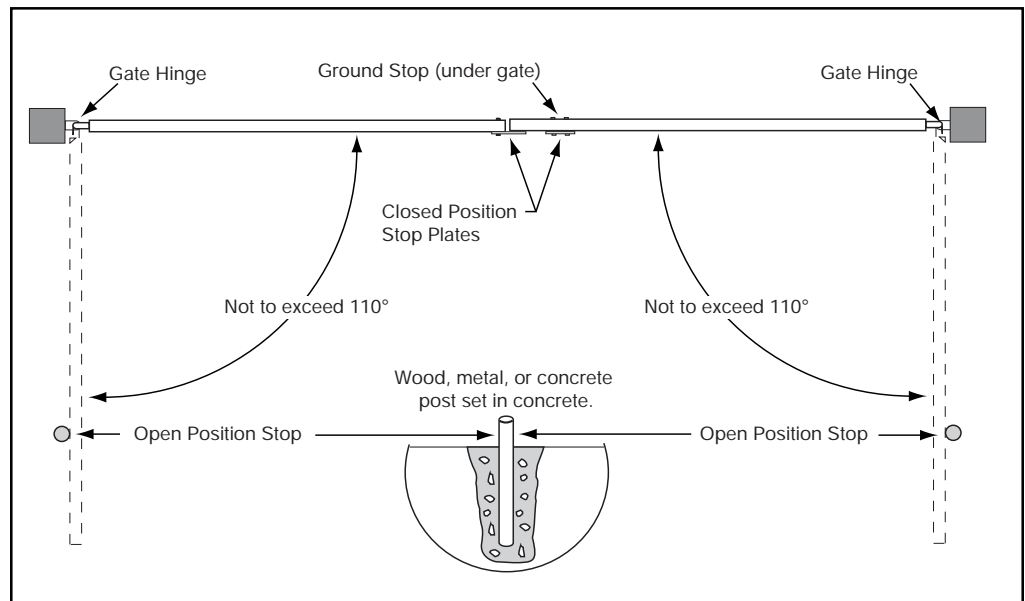


The open position stop for the second gate is installed the same as the first gate. See instructions on page 16.

The Closed position stops on a dual gate system require a ground stop for the second gate (first to close) to be installed as follows:

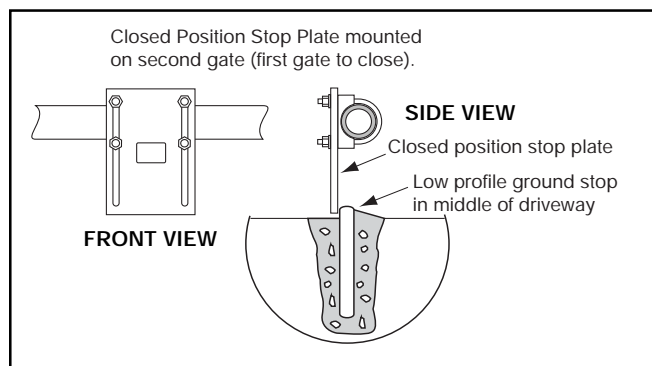
Step D1:

Attach the closed position stop plate vertically to the inside bottom of the gate that will receive the second operator (for push-to-open, install plate on outside of gate). In this illustration this is the gate that will close first.



Step D2:

Install a closed position ground stop in driveway securely into ground directly below the gate. The positive stop plate installed in Step D1 should rest against the ground stop in the closed position. For added security, install a **GTO Automatic Gate Lock** (see *Accessory Catalog*).



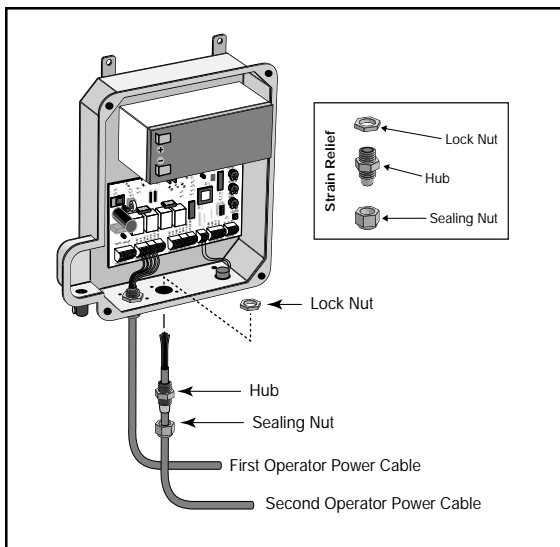
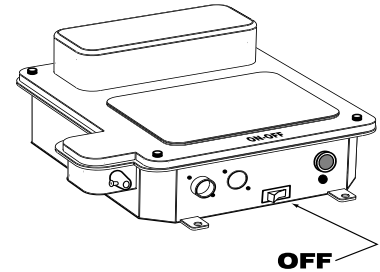
Step D3:

Return to *page 11, Single Gate Operator Installation*, and repeat **Step 1 through 15** to install the second operator. This time in **Step 15**, however, the closed position stop plate on the first gate will contact the leading edge of the second gate.

Connecting the Second Operator to the Control Board

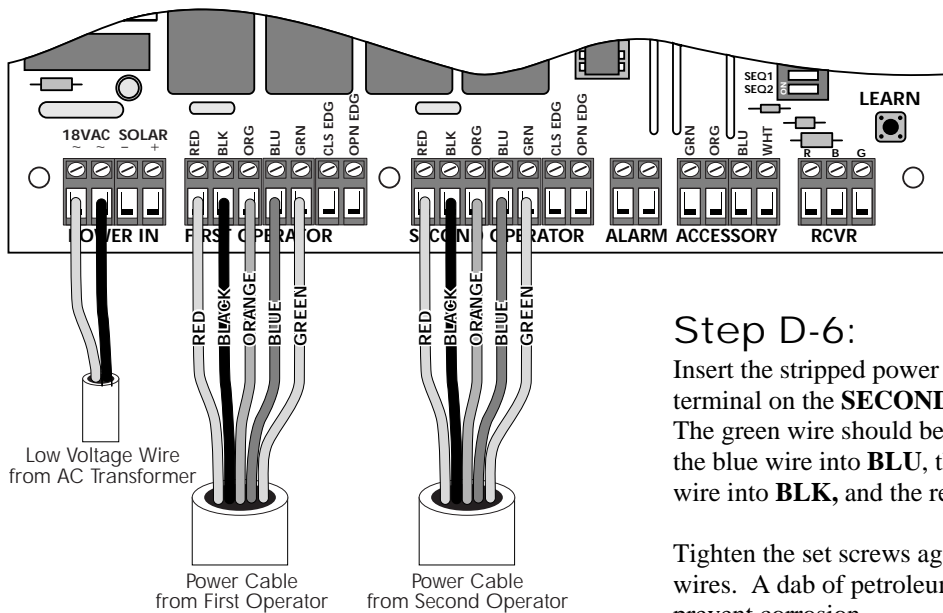
Step D-4:

Turn power switch **OFF**. Remove the control box cover. Using a steel punch or screwdriver, remove the thin plastic knockout in the second operator connector hole at the bottom of the control box. **Work from the inside out to prevent any possible damage to the control board.**



Step D-5:

Insert the strain relief into the knockout hole and finger tighten it in the control box. Insert the stripped end of second operator cable up through bottom of strain relief (if necessary, loosen the strain relief). Pull approximately 4" of wire into the control box and retighten the strain relief on the black sheath of the power cable.



Step D-6:

Insert the stripped power cable wires into the appropriate terminal on the **SECOND OPERATOR** terminal block. The green wire should be inserted into the **GRN** terminal, the blue wire into **BLU**, the orange wire into **ORG**, black wire into **BLK**, and the red wire into the **RED** terminal.

Tighten the set screws against the stripped end of the wires. A dab of petroleum jelly on each terminal will help prevent corrosion.

Step D-7:

Cut slot into driveway and lay the 25 foot power cable for the second operator in this slot (*see Illustration on page 38*).
NOTE: DO NOT attempt to splice the power cable, and DO NOT remove the connector from the end of the cable.
If you need a longer cable, 35 foot and 40 foot power cables are available (*see Accessory Catalog*).

Setting the Control Board for Dual Gate Installations

DIP Switches

The Control Board DIP switches must be set to accommodate your particular type of installation. Since the **SNGL / DUAL**, **SEQ1**, and **SEQ2** DIP switches are used by dual gate operator systems, they will be discussed in the following steps.

Step D-8:

Make sure the control box power switch is **OFF**.

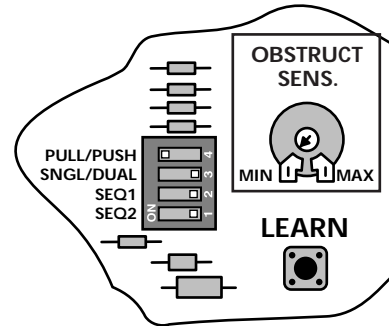
Step D-9:

Unscrew and remove the control box cover. Use a small screwdriver to move the **SNGL / DUAL** DIP switch to **DUAL** (*see illustration*).

The order of gate operation ("sequencing") must now be determined for your dual gate operators to function properly.

Refer to the illustrations on the next page.

NOTE: The terms "FIRST OPERATOR" and "SECOND OPERATOR" refer to a unit wired to the terminal block of the same name.

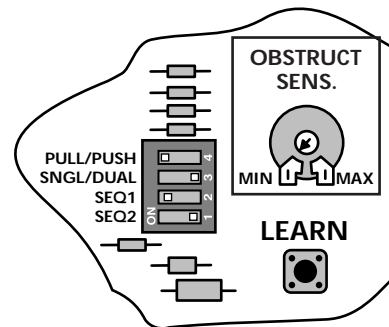


Step D-10:

BOTH OPERATORS OPEN SIMULTANEOUSLY
BOTH OPERATORS CLOSE SIMULTANEOUSLY

SEQ1 = ON SEQ2 = OFF

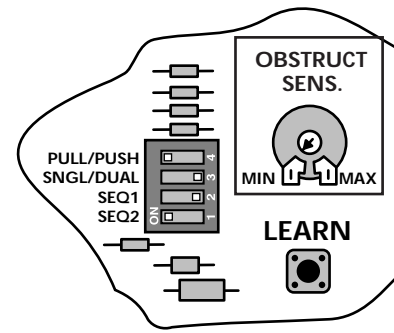
If **SEQ1** is set to **ON**, and **SEQ2** is set to **OFF**, the **FIRST OPERATOR** and **SECOND OPERATOR open** simultaneously (*see illustration*), and the **FIRST OPERATOR** and **SECOND OPERATOR close** simultaneously.



FIRST OPERATOR **OPENS** FIRST,
SECOND OPERATOR **CLOSES** FIRST

SEQ1 = OFF SEQ2 = ON

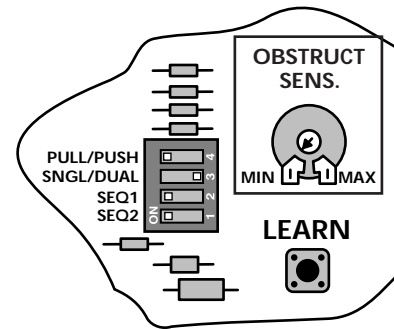
If **SEQ1** is set to **OFF**, and **SEQ2** is set to **ON**, the FIRST OPERATOR will **open** first, and the SECOND OPERATOR will **close** first (*see illustration*).



FIRST OPERATOR **OPENS** FIRST,
FIRST OPERATOR **CLOSES** FIRST

SEQ1 = ON SEQ2 = ON

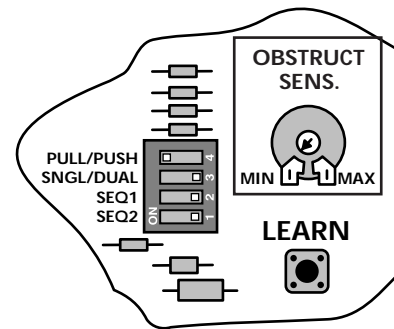
If **SEQ1** is set to **ON**, and **SEQ2** is set to **ON**, The FIRST OPERATOR **opens** and **closes** first.



BOTH OPERATORS **OPEN** SIMULTANEOUSLY
SECOND OPERATOR **CLOSES** FIRST

SEQ1 = OFF SEQ2 = OFF

If both **SEQ1** and **SEQ2** are set to **OFF**, the FIRST OPERATOR and SECOND OPERATOR **open** simultaneously. The SECOND OPERATOR will **close** first.



STEP D-11

Replace the control box cover. Turn the control box power switch to **ON**. Set the closed gate positions for the first and second operators by adjusting the limit switch (*review step 30*).

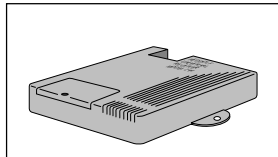
Your automatic gate operator system is configured for dual pull-to-open gates.

Accessories Available Through Your Dealer



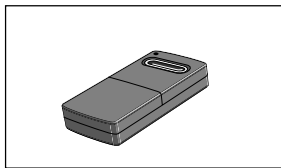
GTO Digital Keypad (F300)

The weatherproof digital keypad can be easily installed as a wired or wireless keypad for all GTO swing and slide gate operators, and as a wired keypad for the Bulldog Pedestrian Gate Lock. It can be programmed to recognize fifteen different personal identification number (PIN) codes. Each code is face programmable with additional security features built in. Requires 3 AA batteries (*not included*). Can also accommodate most garage doors and other gate openers. If used as a wired keypad, 16 gauge standard, low voltage direct burial wire will be required (*see RB509*).



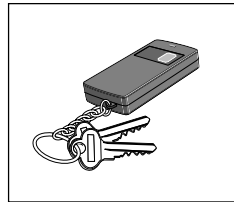
Garage Door Receiver (RB709)

Allows the use of the same GTO remote transmitter (*see Dual and Triple Transmitters*) to control the gate operator and garage door opener. Compatible with most garage door openers.



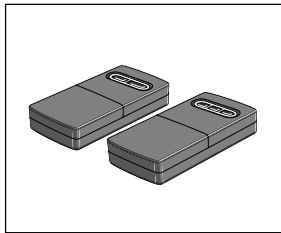
GTO Entry Transmitter (RB741)

The GTO Entry Transmitter, with adjustable code settings, is standard equipment with all GTO gate operator systems. Battery included.



GTO Key Chain Mini Transmitter (RB744)

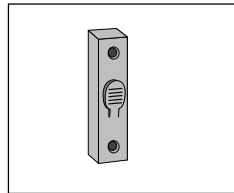
This miniature version of the GTO entry transmitter has the same adjustable code settings. Battery included.



GTO Dual Transmitter (RB742)

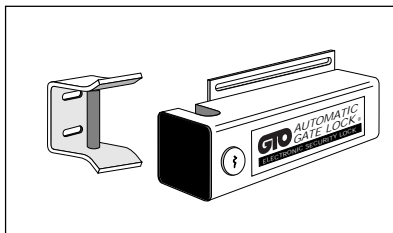
GTO Triple Transmitter (RB743)

The two and three button transmitters are used for the remote control of two or three gate operators and garage door openers (*See Garage Door Receiver*). Battery included.



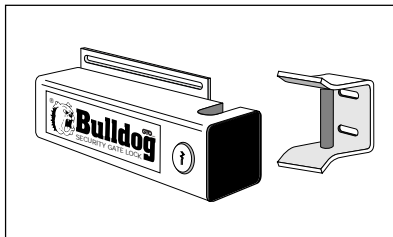
Push Button (Doorbell) Control (RB101)

Unlighted doorbell button for remote entry or exit control. Connects directly to the control board using 16 gauge stranded, low voltage, direct burial wire (*not included, see RB 509*).



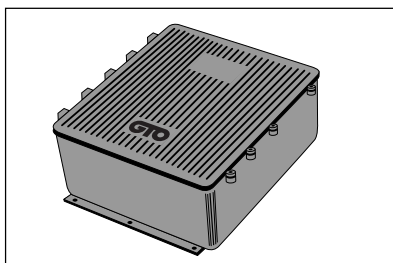
GTO Automatic Gate Lock (FM144) for closed position pull-to-open applications

A MUST for added security. The plated steel bolt lock has a zinc plated steel housing and is driven by a 4 ampere solenoid. This horizontal electronic lock is used with all GTO low voltage swing gate operator systems (not to be used with GTO/PRO AC powered operators) for additional security and stability. Comes with a keyed manual release.



GTO Automatic Gate Lock (FM142) for open position or push-to-open applications

Similar to FM144, but used to secure gates in the open position or for push-to-open gate applications (*not shown*).

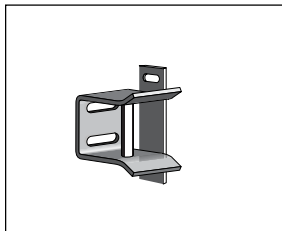


GTO NEMA Box (FM317)

GTO's NEMA 4X rated weatherproof box is large enough (14" W x 6" D x 16" H) to accommodate all add-on items necessary for custom gate operator installations. It is made of fire retardant ABS plastic and comes with a heavy duty 14 gauge steel backing plate for mounting accessories. The unique, lockable cover (use the Master[®] Pin lock RB975 for added security) can be completely removed for easier access during installation and service.

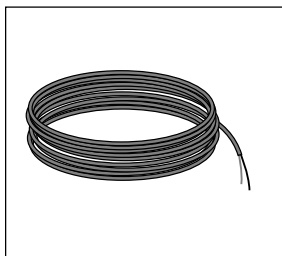
The NEMA box is standard on all GTO/PRO AC powered operators.

ACCESS-ories



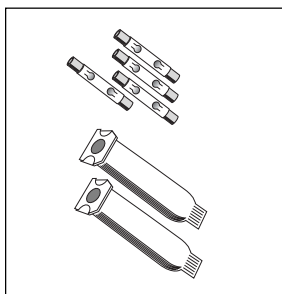
Column Mount Lock Receiver (433IH)

For mounting the **Automatic Gate Lock** or **Bulldog Pedestrian Lock** in areas with limited space between the gate and post, such as brick columns or walls.



GTO Low Voltage Wire (RB509)

The 16 gauge dual conductor, multi-stranded, direct burial low voltage wire is required to connect the control board to the solar panel or the AC transformer. This wire is also required for installation of some accessories such as keypads, locks, or push buttons (*available in 1000' rolls and specially cut lengths*).

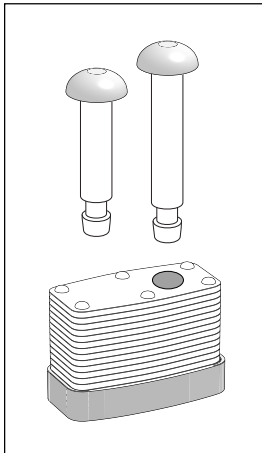


Splice Kit - Above Ground (RB707)

For providing secure and moisture resistant above ground splices for solar panels, key pads, push buttons and other accessories using GTO low voltage wire.

Splice Kit - Direct Burial (RB708)

When direct burial wire running below ground needs to be spliced the **RB708** splice kit **must** be used.



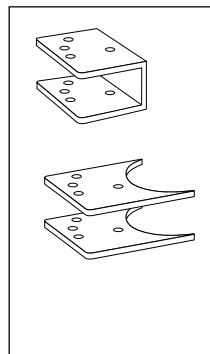
Master® Pin Lock (RB975)

for GTO/PRO 1000/1200

Master® Pin Lock (FM320)

for GTO/PRO 2000/2200

The pin lock is a substitute for the clevis pin at either or both mounting points of the GTO/PRO 1000 operator arms and the gate bracket end of the GTO/PRO 2000. They help prevent theft of the operator arm while allowing quick release of the operator when necessary.

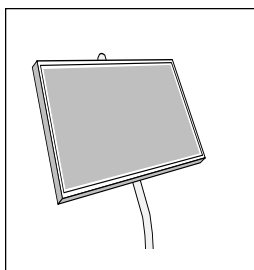


4" (O.D.) Post Bracket (RB464)

Recommended for mounting GTO/PRO 2000 to a 4" gate post.

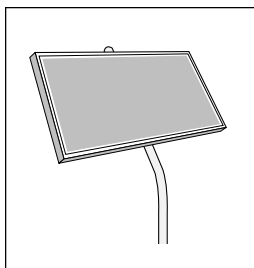
4" (O.D.) Round Post Bracket Adapters (RB469)

These adapters are necessary when mounting the 4" post bracket to a 4" (O.D.) gate post. **Two required for each gate.** Use with 4" Post Bracket (RB464).



Operator Solar Panel (FM123) - Improved, Amorphous Silicon (comes with a Two Year Warranty)

This 10 watt solar panel is a battery charger for use with **GTO/PRO Low Voltage Automatic Gate Operator** systems. Particularly suited for remote installations, the solar panel comes with tubular steel support, mounting clips, wire connectors, and 8 ft. of low voltage wire (*for longer lengths, see RB509*). All GTO low voltage operators are pre-wired for solar panels. Installation in some regions of the world will require multiple panels for adequate charging power. Recommended for **GTO/PRO 2000/2200, GTO/PRO SL-1000/SL-1200**.

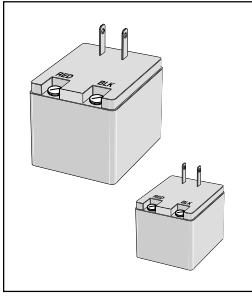


Operator Solar Panel (FM122) - Improved Amorphous Silicon (comes with a Two Year Warranty)

The 5 watt solar panel is a battery charger for use with **GTO/PRO Low Voltage Automatic Gate Operator** systems. Particularly suited for remote installations, the solar panel comes with tubular steel support, mounting clips, wire connectors, and 8 ft. of low voltage wire (*see Low Voltage Wire for longer wire*). All GTO low voltage operators are pre-wired for solar panels. Installation in some regions of the world will require multiple panels for adequate charging power. Recommended for **GTO/PRO 1000, GTO/PRO 1200** and the **GTO Bulldog Gate Lock**.

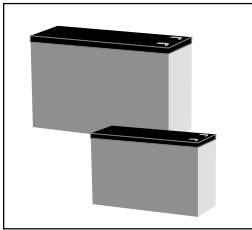
Dual gate installations require minimum of two (2) 5 watt solar panels for adequate charging power.

ACCESS -ories



Standard Replacement Transformer (RB570) – Standard 18 Volt, 40 VA, AC transformer for charging the battery included with the **GTO/PRO 2000 series** gate operators.

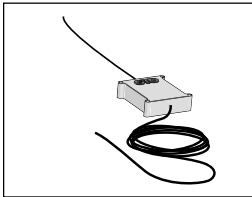
Bulldog Replacement Charger (RB421) – Standard 12 volt DC charger (*not shown*) for maintaining battery included with the Bulldog Pedestrian Gate Lock.



Replacement Batteries

RB500 – The standard 12 volt, 7.0 ampere-hour, maintenance-free battery for all **GTO/PRO** gate operators. This is the only battery approved for use with **GTO** gate operators. Battery life 3 to 5 years.

RB422 – The 12 volt, 1.2 ampere-hour version for use with the Bulldog Pedestrian Gate Lock.



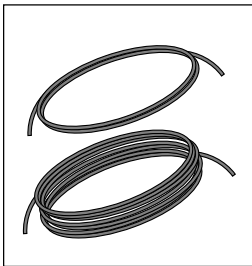
Replacement Receivers

The **AQ201**: Receiver with a 10 ft. cable (included).

The **AWQ325**: Receiver with a 25 ft. cable.

The **AWQ350**: Receiver with a 50 ft. cable.

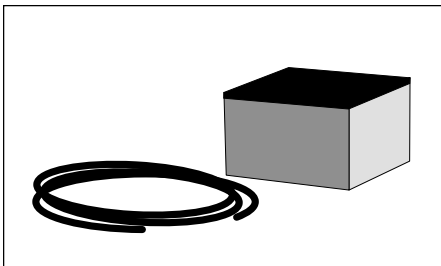
The **AWQ400**: Receiver with a 100 ft. cable.



Standard Replacement Power Cables for Gate Operators

The **PRO 6C (AW209)**: 6 ft. power cable included with **GTO/PRO 2000** single gate operators.

The **PRO 50C (AW210)**: 50 ft. power cable included with **GTO/PRO 2200** dual (second) gate operators.



40 Amp Hour Battery Kit (FB296)

This large 12 volt, 40 ampere-hour, maintenance-free battery is for the **Mighty Mule** gate operators. It will supply additional power for increasing the number of open and close cycles. The kit comes with the battery and wiring harness for easy installation. Battery life 3 to 5 years.

GTO, Inc. gate operator accessories are warranted by the manufacturer against defects in materials and workmanship for a period of one year, unless otherwise stated, from the date of purchase provided recommended installation procedures have been followed. Warranty is considered void if damage was due to improper installation or use, connection to an improper power source, or was caused by lightning, wind, fire, flood, insects, or other natural agent.

Installation Check list

The installation of this operator conforms to CLASS _____.

The installer verifies that (each item except *safety edges* must be checked):

___ Recommended safety edges were installed.

___ Customer was informed that this gate is for vehicular use **ONLY**. Pedestrians **MAY NOT** use this gate.

___ A separate gate or entrance was installed for pedestrian use.

___ Closed position stop plate was securely fastened.

___ All power cables, receiver cables, and transformer plugs were securely fastened.

___ Petroleum jelly was applied to the control board terminals.

___ All warning signs and labels were installed as specified in the **IMPORTANT SAFETY INSTRUCTIONS**.

___ The **IMPORTANT SAFETY INSTRUCTIONS** were reviewed with the customer.

___ The **Installation Manual** was given to the customer.

___ The customer was instructed to use silicone spray on the push/pull tube, front mount, and rear mount to maintain the gate operator.

___ Customer was instructed about disconnecting the operator for manual operation of the gate

___ Customer was instructed about proper use of transmitter and (or) other entry controls.

___ Customer was asked to fill out customer support card and mail it to GTO, Inc.

___ Customer was asked to retain **all receipts** (receipts provide proof of warranty).

___ The completed installation was photographed from both the front and back of the gate. Photo was dated.

Customer's Signature

Date

Installer's Signature

Date